THE

COMMAND AND GENERAL STAFF SCHOOL

MILITARY REVIEW

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THE COMMAND AND GENERAL STAFF SCHOOL
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To: Students of the Military Profession.

The volume of military literature no doubt is greater today than ever before. Some of it is authoritative and sound; some is attractive and readable, but lacking in factual support, proper analysis, and logical conclusions. Unless there is a painstaking sifting and keen evaluation, even a military reader is lost or misguided in a maze of conflicting and distorted statements and warped views.

Never have there been so many unanswered military questions -- weapons, transportation, mechanization, communication, organization, and supply. These questions are inherently baffling; otherwise they would not exist. Yet we must find answers in order to be prepared for war.

The Command and General Staff School Military Review, prepared by selected officers, offers you the best of military literature, in a form which cannot fail to commend itself to the serious military student.

L. J. McNAIR,
Brigadier General, United States Army,
Commandant.

Volume XIX
1939

Number 74

THE

COMMAND AND GENERAL STAFF SCHOOL

MILITARY REVIEW

QUARTERLY REVIEW OF MILITARY LITERATURE

LIEUTENANT COLONEL E. M. BENITEZ, *C. A. C., Editor*
MAJOR M. D. BARNDOLLAR, *Infantry, Assistant Editor*

September, 1939

Third Quarter

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Books

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Infantry in Battle—*Infantry Journal, Inc.*

The Rise of American Naval Power—*By Harold and Margaret Sprout*

Poland: Key to Europe—*By Raymond Leslie Buell*

Remember the Maine—*By Gregory Mason*

Bombs Bursting in Air—*By Major George F. Eliot*

Our Maginot Line—The Defense of the Americas—*By Livingston Hartley*

Secret Agent of Japan—*By Amleto Vespa*

Wheat and Soldiers—*By Corporal Ashihei Hino*

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Mission

The object of this publication is a systematic review of current military literature, through cataloging articles of professional value, in selected military and naval periodicals, in the domestic and foreign field.

Articles from foreign periodicals are treated by translations of titles and digests of contents; material of particular importance is covered more extensively in a section of "Foreign Military Digests."

A "Library Bulletin" Section lists books, recently accessioned, which are of particular significance.

This *Review* is published as a guide to modern military tendencies and to inspire vigorous thoughts on the subjects treated.

The opinions expressed and conclusions drawn in articles are solely those of the authors and are in no sense official.

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Acknowledgment

The editors desire to express their thanks and appreciation to the many persons who have valuably assisted in the preparation of material for this issue. The work of contributors has been done in addition to their regular duties and on their own time. We are very grateful to the following officers for their generous donations:

LIEUT. COLONEL F. W. BOWLEY: The G-2 Section, Corps General Staff

COLONEL L. H. BRERETON: Air Power

LIEUTENANT J. DASHER: *Krasnaya Zvyezda* (23 March-12 June 1939)

CAPTAIN H. N. HARTNESS: *Die Panzertruppe* (January 1939)

LIEUT. COLONEL L. W. HILLIARD: *Revue Militaire Suisse* (January, February, March 1939)

CAPTAIN H. D. KEHM: *Die Panzertruppe* (February, March, April 1939); *Wissen and Wehr* (January, February 1939)

CAPTAIN A. L. KEYES: *Revue d'Artillerie* (January 1939)

CAPTAIN W. E. LORENCE: *Bulletin Belge des Sciences Militaires* (January, February, March 1939)

MAJOR T. R. PHILLIPS: *La France Militaire* (15 December 1938)

LIEUTENANT J. W. RUDOLPH: Book Review

MAJOR L. K. TRUSCOTT, JR.: *Revue de Cavalerie* (March-April 1939)

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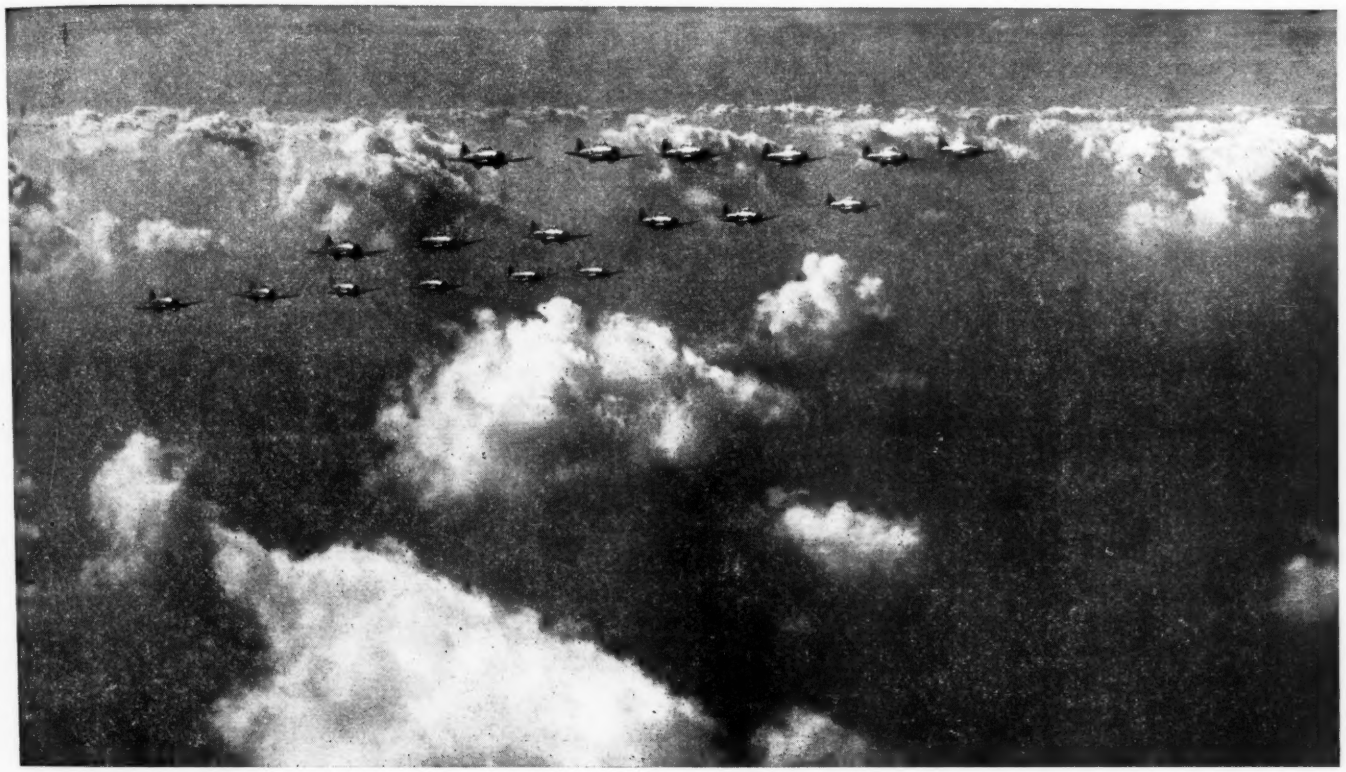
The Cover

Boeing B-17, "The Flying Fortress," considered by experts as the best long distance bomber in the world today.

Official Photograph, U. S. Army Air Corps.



Official Photo, U. S. Army Air Corps.

PURSUIT SQUADRON, WAR STRENGTH, IN FORMATION

Air Power

BY COLONEL LEWIS H. BRERETON, *Air Corps*

The Air Power of a nation is its capacity to conduct air operations; specifically, the power which a nation is capable of exerting by means of its air forces.

The application of air power introduces into war a third means, operating in a third element, for the same basic purpose as the application of Land Power or Sea Power, namely, the destruction of the enemy will to fight.

Air strategy is the art of application of air power.

An interpretation of the European conception of air strategy, particularly applicable to the European theater of air warfare is necessary, just as it is also necessary that we should have a working knowledge of the military doctrines of Foreign Powers. Air strategy in Europe is based upon three fundamental ideas:

First: Air Power is recognized as an independent means of waging war in a sphere of action, against objectives, and under conditions completely foreign to the land and sea forces. The air forces of all the leading powers are organized on this basis.

Second: Undoubtedly, air power will be applied directly against objectives far in the interior of the enemy country, and the targets—initially at least—will be those of economical, political and purely military importance. It is difficult to see how this can be otherwise.

The Air Force is an M-day weapon and as such its effectiveness gives the aggressor an enormous advantage. It can attack without warning, and before the opponent has set in motion the cumbersome machinery of mobilization, concentration and defense.

Third: The ultimate objective of air power is to exert pressure against the enemy will to fight by direct action against vital elements within the enemy nation.

THE OBJECT OF WAR

Between nations at war, there is invariably a political objective, which in the case of a defensive war is simply the denial of the enemy of his desires. The political objective, in general, corresponds in the realm of strategy to that of the mission in the realm of tactics.

The political objective, that is to say, the strategic mission, may require three general types of action as follows:

1. Physical acquisition and political domination. Examples of this type are Italy's conquest of Ethiopia, the Japanese conquest of Manchukuo and the German annexation of Austria and Czechoslovakia.

2. Political acquiescence, that is to say, imposing national policy and political objectives without the intention

of seizing territory. Examples of this type are the War of 1812 and the American participation in the World War.

3. Political and physical defense. Fight for the protection of national rights and security. An example of this type would be the maintenance of the Monroe Doctrine.

The Armed Forces

The strategic mission—political objective—in most instances will dictate that one of the armed forces will have paramount interest.

The Ground Force. If the object of war is physical acquisition, reliance must finally be placed on the ground force. If the object of war is political acquiescence, or political and physical defense, primary reliance may or may not be vested on the ground force, depending upon the situation—mainly geographical limitations.

In the first instance, the army exerts pressure against the enemy will by occupation and control of territory vital to the enemy nation. This may be called the *ultimate objective* of the land force.

Limitations: The army must normally defeat the enemy army before attaining its ultimate objective. Its effort is exerted only on land. Its strategic mobility is limited by its lines of communication and the location and security of its bases.

The *Sea Force:* The basic power of the Navy lies in its ability to control the vital sea areas. This may be called its *ultimate objective.* Of itself, it is not capable of occupation and political control.

It may enforce political acquiescence and physical defense. If the Navy can control the sea communications of an enemy dependent upon such communications, sea power may, of itself, force political acquiescence and the security of its own coasts.

Limitations: Sea Power has no direct influence upon nations not primarily dependent upon sea communications. The strategic mobility of the navy is limited by the location and security of its bases and lines of communication.

Securing the sea lines of communication involves defeat of the enemy sea forces, or containing them. In the presence of enemy air power it is not possible for sea forces alone to control sea communications, nor to protect its coasts from enemy air forces. Hence, sea power exerts its principal sphere of influence beyond the radius of action of enemy air forces.

As an example, consider the situation in the Mediterranean Sea. In 1935 the threat of Italian Air Power forced the British to abandon their naval base at Malta and forced a redistribution of the British Mediterranean Fleet. Italian air power, in the eyes of competent military authorities, was a decisive factor in preventing British intervention in Ethiopia, for which British control of sea communications in the Mediterranean was essential.

The Air Force: The air force exerts pressure against the enemy will to fight by direct action against vital elements within the enemy nation. This is the *ultimate objective* of air power.

Air power may destroy the enemy will to resist; it may force political acquiescence and achieve political and physical defense by air action or by the threat of air action alone.

Air forces cannot achieve physical acquisition, they cannot occupy territory.

Limitations: The strategic mobility of air forces is limited by the number, location and security of its bases.

Air forces are capable of conclusive direct pressure on the *ultimate objective* only against those nations whose vital installations are so concentrated as to be vulnerable to effective action.

The fundamental difference between air forces, sea forces and ground forces is that Air Power can be applied directly against its ultimate objective without first having to overcome the barrier presented by enemy navies, armies or terrestrial obstacles.

The Primary Objective

A foreign author has stated: "Armies and navies seek their opposite numbers; the air force is the enemy of the whole nation." However, it must not be inferred that the air force action is always to be directed against the enemy national structure. Although the application of direct pressure against the decisive element may be desirable, such action is not always effective, even when possible.

The factors which influence the choice of the objective include:

1. The objective of war, that is to say, the *strategic mission.*
2. The effective strength of the air force.
3. Relative vulnerability of the enemy to the *direct* application of air power, which in turn, is affected by geographic considerations and the dispositions and degree of concentration of the vital elements.

The influence which these factors may exert can be best illustrated by the following examples:

1. The Italian campaign in Ethiopia was for the purpose of physical and political acquisition which cannot be achieved by air power. A national structure vulnerable to air action did not exist.

The same may be said of the Sino-Japanese War, with the additional limiting factor of a comparatively ineffective Chinese air force.

2. Assume a war between the two great powers of the Far East, ignoring the implication of alliances, and consider the respective primary objectives of the armed forces in that theater of operations. The national structure of one is dispersed in depth and not vulnerable to air attack; the security of the other rests on the security of her seas and her highly centralized industrial and economic structure. Direct pressure against them can be applied by a powerful neighbor from air bases in the Maritime Province. This hostile air force and air bases must be, therefore, a primary objective. Air Power in the Far East is thus a deciding factor in maintaining the status quo.

The factors leading to the decision that the hostile armed forces may be the primary objective applies directly to practically all air forces.

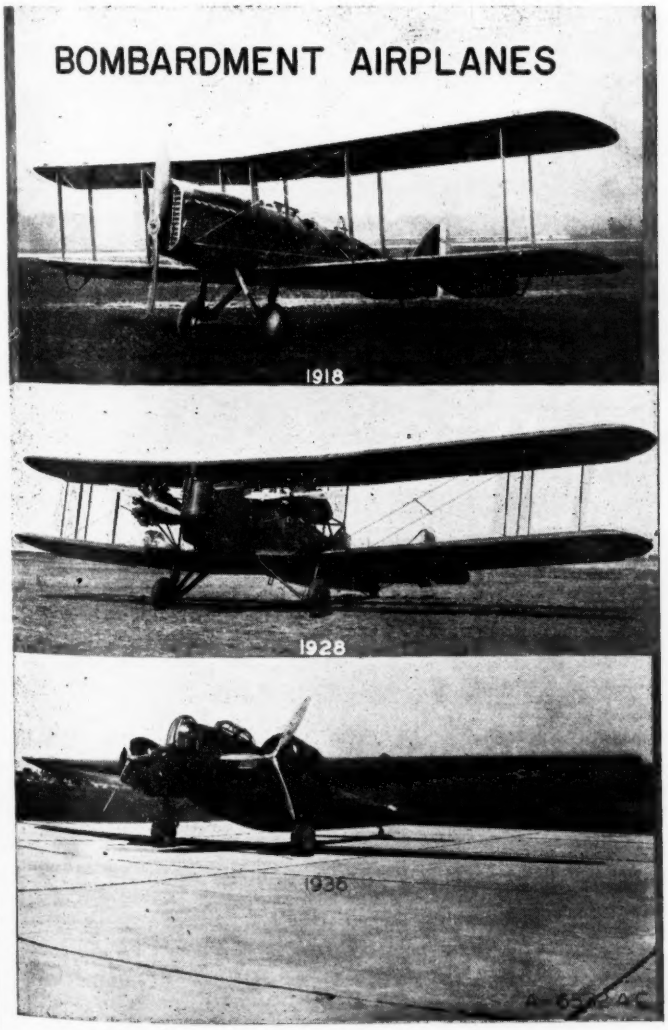
The outstanding strategic factor in our military situation has been our geographic isolation. This fact, coupled with the existence of friendly and non-military neighbors

on our borders, and our tremendous productive capacity for war, has shaped our military policy to a large extent.

In case of aggression against us, our vital industrial areas near our coasts and frontiers must be protected while our war potential is converted into military force. Our sea bases at home and abroad and our line of communications through the Panama Canal must also be protected and maintained.

The ability of hostile land and sea forces alone to bring critical pressure directly against our industrial areas is very doubtful. This would involve occupation following the defeat of our air, sea and land forces. It would require a protracted conflict during which time our defensive mobilization and military power will continually increase.

An air offensive against our vital areas differs radically from the picture just presented. A hostile air force might be established on bases beyond our frontiers but well within range of vital objectives. These bases might be protected against naval action by intervening land, and against land action by intervening water. The mission of the air force has been clearly expressed by our Commander-in-Chief as follows: "We must have armed forces and defenses strong enough to ward off sudden attack against strategic positions and key facilities essential to insure sustained resistance and ultimate victory."



Official Photo, U. S. Army Air Corps.

EVOLUTION OF THE BOMBARDMENT AIRPLANE 1918-1936

EMPLOYMENT OF AIR POWER

An Air Force can be employed in independent air operations, in support of naval forces, in direct defense of the coast and in support of ground forces.

Independent Air Operations: It is unlikely, for example, that any enemy will attempt a landing on our coasts without gaining *air superiority and sea supremacy.* A landing on a hostile shore is always a hazardous undertaking and the advent of Air Power has multiplied its difficulties. However, an unhindered air force may become an immediate and powerful threat against our coasts, our concentration areas, our supply and communication establishments, industries vital to our war effort, and against our great centers of population.

It is very possible that the initial employment of the Air Force may consist of independent operations in defense of coastal frontiers or reinforcements—to some extent—of the defenses of Alaska, Hawaii or Panama.

Support of naval forces: In any situation in which joint Army and Navy operations are undertaken, all available air strength should be used, whenever possible, by either service in support of the other. General Westover, late Chief of the Air Corps, made the following statement in this connection in one of his lectures:

"In the United States, we do not have a unified Air Force and it is, therefore, of prime importance that our Army and Navy air elements be trained in closest cooperation and conjunction. Without question, they will be placed under a single command during the air phase of any major attack launched at our shores, and each must accordingly be familiar with the operating systems and practices of the other and be so trained that they will work in complete harmony. If this is not done, by popular demand and insistence, we shall be forced into a permanent unity of air command. I hope that the Army and Navy may be allowed to keep and develop their respective air components, but since all the major nations of the world have unified Air Forces to launch against us, it cannot be expected that the Army and Navy air components will be permitted to operate alone, each unaided by the other. If they cannot be trained and taught to operate in harmony, there is not the slightest question but that eventually they will be placed under a separate and unified command. It behooves us who believe the present organization sound and effective to urge closer coordination of training and fuller cooperation in peace time, to the end that there may be no loss of efficiency in the combined and joint operations inevitable in war."

Direct defense of the coast: The direct defense of the coast is the army's responsibility.

The use of the Air Force in coast defense will involve independent bombardment and long-range reconnaissance missions and, as the enemy comes within the sphere of influence of ground arms, of close support to the coastal frontier and defense forces.

Support of ground forces: Operations during the battle of the ground forces and subsequent thereto are in the nature of direct support and are usually controlled by the commander of the ground forces.

Prior to battle, operations will be directed generally against the hostile lines of supply and communications, fighting troops and the hostile air force. Thus, under *fighting troops* must be included not only the army itself, but the *rail and road communications* upon which their mobility depends.

Supply covers a vast range of objectives from the raw material sources down to the rolling kitchens. However, in the *combat zone* the distinction between objectives classified as supply and fighting troops merge. Operations directed at one will necessarily affect the other. Methods of attack will not differ and will probably result in concentration against *communications*, which is the bottleneck for both supply and fighting troops.

Attack on Communications:

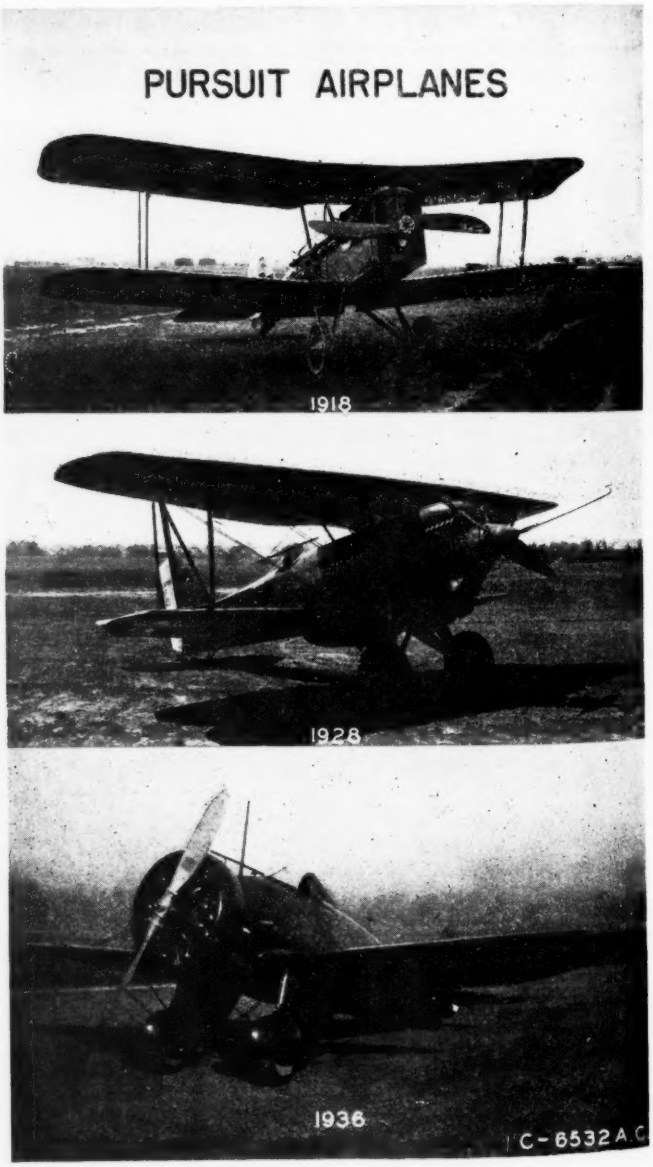
Official Photo, U. S. Army Air Corps.

EVOLUTION OF THE ATTACK AIRPLANE 1918-1936

Roads: Large movements of troops by road are very vulnerable to attack from the air. However, it is the effect against troops using the road, and the dislocation of traffic, and not the effect on the road itself which constitutes the objective.

In the attack of movements by road, one condition necessary for success is that the striking force must have space in which to develop its power. It seeks to achieve results by continuity of action. Its attacks must be initiated sufficiently far from the enemy objective or point of deployment so that successive attacks will build up effective results.

Railroads: Destruction of railroads is not essential to insure *dislocation of traffic. Continuity of effort* is necessary, however, to maintain the degree of dislocation necessary, unless the time element of delay can be accomplished in one attack. This does not necessarily mean that successive attacks to maintain dislocation must be as powerful as the initial blow. Very frequently the necessary degree of dislocation can be maintained by a much smaller force, once the initial disruption has been effected. A railroad system, even a single-line main artery is a highly organized and complex structure. This is particularly true during operations at maximum capacity, as in mass troop movements and concentrations. A comprehensive system is even more so. A really important stoppage at even one point in the system



Official Photo, U. S. Army Air Corps.

EVOLUTION OF THE PURSUIT PLANE 1918-1936

has far reaching effect. The following example from the World War illustrates the case in hand:

During the German concentration for the winter battle in Masuria in February 1915, a troop train was derailed and wrecked near Konitz in East Prussia. The wreckage was cleared and the road repaired rapidly. The resultant delay at the detraining points, which were not far distant, was not serious. However, one of the units in the concentration was the German XXI Corps, en route from the La Fere area in France, on the Western Front, via Sedan and Trier. The result of this minor stoppage in East Prussia was a delay of 14 hours of this Corps in the Sedan district, hundreds of miles away from its destination.

A complete breakdown of communications probably will not be possible. The effects of air action are limited by:

1. The vulnerability and flexibility of its system.
2. The existence of bottlenecks.
3. The density of traffic.
4. The effective strength of the air force.

While the hostile army is one of the objectives of the Air Force, it is not necessarily the most important. Actually, unless the probability exists of decisive exploitation of the battle on the ground, the value of the army as an objective may be secondary, in addition to being the most costly. Even when we have an army in the field there may be periods, as there were in the World War, when the decisive task is not the defeat of the enemy army.

For example: In the Spring of 1917, the Allies were all but defeated as a result of the submarine campaign of the Central Powers. The 1917 offensive on the British front in Flanders was planned to clear the Germans from their U-boat bases in Belgium as well as to relieve pressure on the French front. Plans for this operation had been drawn up in the Spring of 1917, after the failure of General Nivelle's offensive on the Aisne. Sir Douglas Haig, the British Commander-in-Chief, had been warned by the Admiralty that if the Belgian coast was not cleared, the British Fleet might not be able to hold the Channel communications and, as a consequence, Great Britain could not continue the war in 1918.

At this stage of the war, certainly the *correct mission* of the Allied air forces was to support the naval forces in the suppression of the submarine menace.

It is true that only thirty per cent of the German Submarine Fleet was based in Belgium within bombing range. However, this thirty per cent accounted for considerably more than thirty per cent of the Allied shipping destroyed, and constituted a vital threat to Allied success. And yet, at this time, not only was a large scale army offensive being planned which required the whole support of the air forces, but air forces were being withdrawn from the support of the armies in France for the defense of London.

Conclusion

The art of air warfare lies in the capacity to select and concentrate on the *primary objective at the time;* that is to say, the objective which will contribute most effectively to the *ultimate mission* of the armed forces.

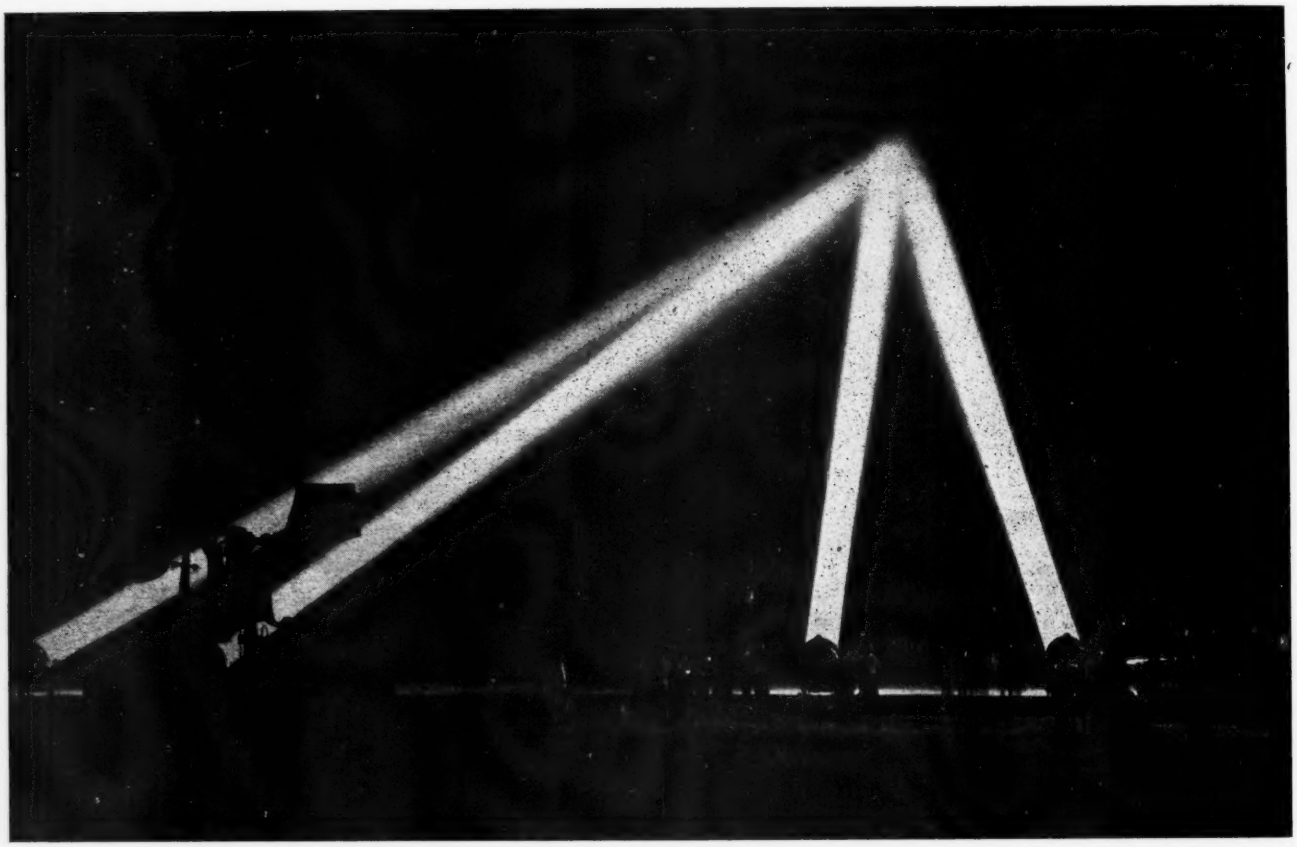
There are no new military thoughts in the modern conception of the application of air power. Nearly half a century ago, an enlightened student of the Art of War enunciated doctrines which are sound and fundamental today. In 1893, Major—later Lieutenant General and Field Marshal—J. D. Fullerton, Royal Engineers, British Army, made the following remarks before the International Congress of Engineers:

"It seems quite probable that in the near future, air warfare will have to be counted on. This will, practically speaking, revolutionize the Art of War. Owing to the high rate of speed which airships will attain, it will be necessary for all nations to maintain themselves ready for war at very short notice.

"The nations most affected by air warfare will be those who depend for their defense upon navies.

"Warfare by sea and by land will only be possible when a nation has command of the air."

Perhaps the highest compliment to American civilian aviation is paid by foreign countries. Fifty-five foreign air lines use our airplanes and fly more than 150 of our American-made air liners. Several foreign nations which build their own planes use American-made engines. Others use our accessory products such as our propellers, radio, flight and navigation instruments. Our successful foreign markets for our various aviation products are the highest tribute to the efficiency of our planes, our engines and our accessories.



SEARCHLIGHT AND SOUND LOCATORS IN ACTION

Antiaircraft Defense

BY MAJOR MUIR S. FAIRCHILD, *Air Corps*

Antiaircraft defense is not a strictly military problem in the sense that we usually think of defenses. We are not concerned with the defense of troops and military forces alone. In fact, our principal concern may be with the defense of civil establishments—fixed objectives. Barcelona and other cities of Spain on one side of the world; Shanghai, Nanking and other great cities of China on the opposite side —bear eloquent testimony to the effect of attack from the air, even by small air forces. Whatever may be the ultimate effect of such air attacks, it is agreed by all, particularly by the suffering population, that they are a terrible disaster. Whether or not such attacks may win a war, it is manifest that attacks from the air inflict great damage to the people and the country being attacked. It becomes necessary, therefore, to be prepared to prevent such attacks if it can be done and to minimize their effects if they must be endured.

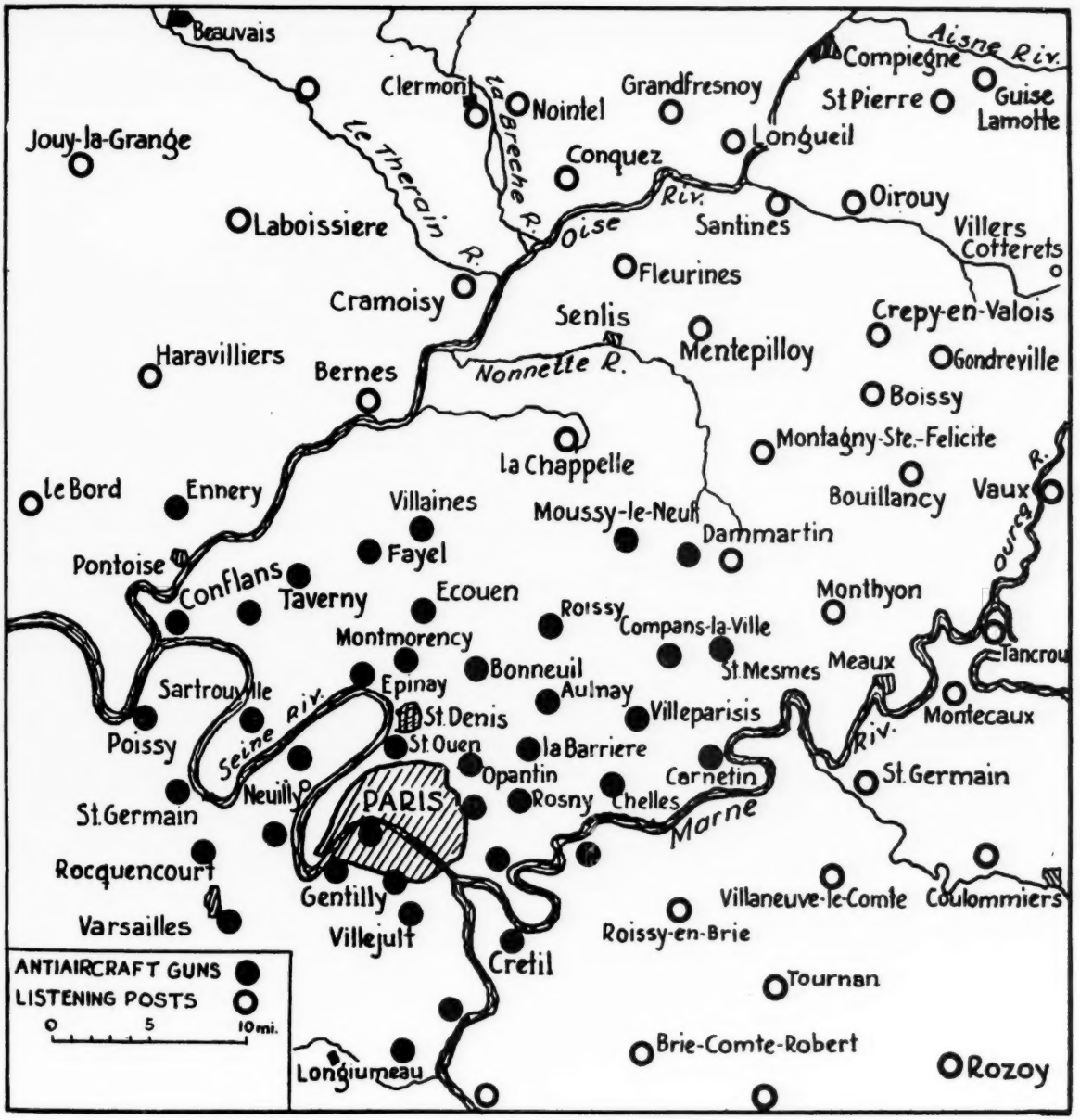
Defense is only one method of countering an air offensive. In fact, a powerful counteroffensive striking the hostile air force at its base and against the installations that sustain hostile air operations is the most effective way of compelling an enemy to cease his attacks.

However, until complete victory is achieved by this or by some other means, the necessity for maintaining the most effective antiaircraft defense that can be devised is only too obvious.

European powers being in immediate danger of air attack, have devoted considerable time to planning a defense. With them the problem of antiaircraft defense is a very real, vital, pressing problem, which must be treated as an immediate reality. In Europe today, civil as well as military leaders, recognize the possibility that air attack may come without warning. It seems logical, therefore, that we consider the problem of antiaircraft defense as European leaders see it, and examine some of the defensive measures which they have undertaken.

Sir Samuel Hoare, British Home Secretary, in charge of the passive defense program in England, recently stated in Parliament:

> "We have been driven to admit that * * * no air raid precautions can insure to the population of this or any other highly industrialized European country



SKETCH NO. 1—ANTIAIRCRAFT DEFENSES OF PARIS, JULY 1918.

complete immunity * * *. It has been clear to all of us that the most we can do is to minimize the catastrophe."

A gigantic program of *passive defense measures* is now being carried forward throughout the British Isles. The direct cost to the national government of this passive defense program has been set for the fiscal year 1938 at forty-two and a quarter million dollars—and this was before the Czechoslovakian crisis. This amount has now been greatly exceeded. And even this large sum was only a small fraction of the total cost which had been estimated, because the national government is paying only a small part of the bill. It had been estimated that local and personal costs for shelters—bomb and gas-proof cellars and trenches—would probably come to three and a half billion dollars alone.

In addition to her considerable experience in the World War, Great Britain has done a great deal of thinking about this general problem of antiaircraft defense. Let us look briefly at her past war experience so that we may better understand the steps she is taking today.

At the outbreak of the World War, almost the only aircraft in existence capable of attacking England were the German zeppelins, of which the army possessed six and the navy only one. Due to faulty employment by the army high command, three of their ships were shot down on their first flights which were made over the front lines in France. It was, therefore, not until January 19, 1915, that the first zeppelin attack was made against England. In the five months which had elapsed since the outbreak of the war something had been done to improve the defenses of the country, though in September only a few of the most important arsenals and naval bases had any sort of antiaircraft guns. In London, there were only three one-pounder pom-poms. There were, of course, no true pursuit aircraft. Restrictions on lights at night were put into effect in September 1914—the first of the passive defense measures.

It is interesting to note in passing that there *had* been a couple of previous attacks on England by airplanes—the first taking place on December 21, 1914. These bombing attacks caused no particular damage and did not attract much attention. The zeppelin attacks, however, while almost completely ineffective, by present day standards, did kill quite a few persons and caused considerable property damage. This resulted in an insistent demand for an adequate active defense against their attacks.

In response to this demand great efforts were made to build up the defenses—particularly those of London.

In spite of these efforts and the extreme vulnerability of the zeppelins, it was not until August 9, 1915, that any success was apparent. On that occasion the L-12 was hit by a gun and eventually fell into the sea. By September, 1916, interceptor airplanes began to have successes and to shoot down zeppelins in flames by the use of incendiary bullets. From then on losses became heavy and the raids finally ceased entirely in August 1917. Altogether there were 51 airship attacks before the defense organization was finally perfected to a point that made losses prohibitive.

The principal reason for this long delay in perfecting an adequate active defense against the extremely vulnerable airship appears to have been lack of centralized control. Even after the material means of defense, in the shape of guns and airplanes, were made available, lack of centralized control rendered their efforts almost completely ineffective for over a year. Up until February, 1916, responsibility for antiaircraft defense was evenly divided between the Admiralty and the War Office. Searchlights were provided and controlled by the engineers. Guns were a responsibility of the artillery. Aircraft were provided in small groups, each under an independent commander. The aircraft warning service was a haphazard effort without centralized control and without much interconnection. As might be expected it functioned very inefficiently, both as regards the active defense and for putting the passive measures into effect. As a typical example: On February 10, 1916, a false report from Scarborough extinguished lights and stopped munition work as far away as Bath and Gloucester.

It is not desired to stress this point unduly, but the British efforts to provide a defense against the obsolete zeppelin are important as an example to emphasize the point that they found that centralized control over all the agencies of defense was essential. No real success was attained until centralized control was established. This lesson has not been forgotten and this point is stressed today more than ever.

The defeated airship was superseded by the bombing airplane which had eventually been developed with sufficient range to reach England. The airplane was far less vulnerable than the airship and the defense which had defeated the zeppelin proved ineffective against it. The great speed of these airplanes (which flew at something under seventy miles an hour) allowed them to complete their work over England in the relatively short average time of about an hour and a quarter.

Let us examine the history of this period, briefly, in search of some other fundamental lessons in antiaircraft defense, as learned by the British. General Ashmore, later Antiaircraft Defense Commander of the great London defensive system, says in his book, "Air Defence":

"Harwich was again attacked by sixteen Gothas. On this occasion the defence had 121 machines in the air. None of them saw anything of the enemy; but one squadron, No. 37, while flying on its regular patrol line, came under heavy fire from the antiaircraft guns, two of the machines being badly damaged by shell. There was still a good deal to be learnt in combined defence work. Later we acted on the principle that aeroplane patrol lines and gun areas should be kept separate.

"Our failure to cope with these day aeroplane raids from May to July 1917 makes an interesting study, leading up to one of the first principles of air defence.

"There were six raids in all; we will consider only the three that came well overland; the others can be classed as coastal raids; and it must be accepted as an axiom that no practicable scale of aeroplane defence in England can be effective against surprise air attacks on the coast-line.

"On the three occasions that we take for discussion, it would appear at first sight that the defence should have rendered a good account of itself.

"The relative numbers in the air on the three days were:

Date	*Bombers that came well over land*	*Defending Aeroplanes*
25 May	16	74
13 June	14	94
7 July	22	95

"The Coastal Warning Service worked well, and the majority of defending machines were in the air within ten minutes to a quarter of an hour of the time when the enemy came in over the coast.

"The bombers flew at something under seventy miles an hour (air speed) and, as a rule, at heights well under 14,000 feet. They were over England, on each occasion, rather over an hour and a quarter. On none of the three days were there enough clouds to prevent a good view of the raiders from the ground during practically the whole time: in fact, the Intelligence Branch could plot the course from minute to minute with great accuracy on reports received after the raid was over, from casual observers on the ground.

"The bulk of our pilots did not succeed in finding the enemy at all, and it is in this point that lies the main problem of air defence. Owing to the difficulty of picking up one aeroplane from another in the air, it is essential to give information from the ground, where observation is easier and aircraft can be seen at far greater distances. And, to render this information timely and effective, a great system of ground observation, communication and control is required.

"The great principle of air defence was not yet sufficiently recognized: that although aeroplanes are the first means of defence, they are ineffective unless supported by a control system on the ground."

There are several fundamental lessons in antiaircraft defense contained in this brief summary, as a result of which certain steps were taken.

The first decision was to combine all the elements of the defense, both on the ground and in the air, under one commander. This new combined command, known as the Lon-

don Air Defence Area was established in July, 1917, under Major General E. B. Ashmore. He at once set about establishing an effective information and control service and welding all of the more or less disassociated defense agencies into one organization. Results were almost immediate as regards daytime attacks, and the Germans began resorting to night air attacks for greater security. This made a very difficult problem for the defense as is indicated by General Ashmore's summary in September.

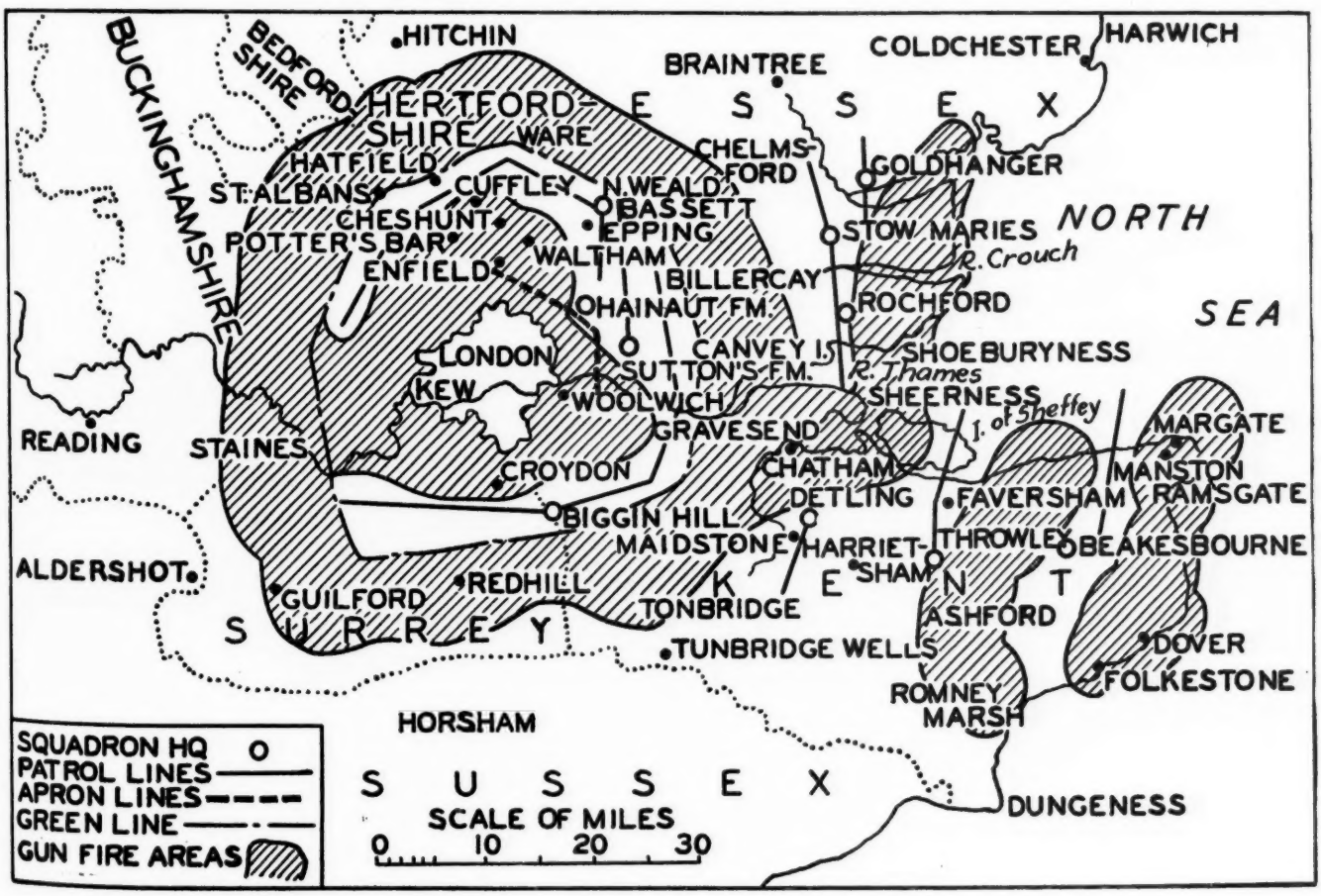
> "In 131 flights, 58 of them in efficient fighting machines, our pilots had only caught sight of an enemy machine on eight occasions; the eight views produced three combats, only one of which was successful. The organization on the ground was not keeping pace with the progress in the air." ("Air Defence"—Ashmore.)

Barrage balloons were introduced by General Ashmore in an effort to channalize attacks and make night interception easier. It was intended to put up twenty extensive balloon aprons round the east end of London. By the middle of 1918, ten aprons were in position and they could be raised to nearly 10,000 feet. There seems to be only one recorded case of an airplane striking one of the London aprons. On January 28, 1918, a German Giant airplane flew through a balloon apron carrying away parts of two apron streamers. A member of a Gotha crew taken prisoner in a later raid stated that a Giant airplane had struck an apron and was considerably damaged as result, though returning home safely with a portion of the cable still trailing from the plane. The Giant was stated to have fallen some hundreds of feet before the pilot was able to regain control.

In spite of this rather negative active result there is no doubt that the barrage balloons did exercise a great psychological effect. The most important effect seems to have been, as stated by this German prisoner: To keep all attacking machines at their maximum ceiling during the attack. This simplified the problem of the defense considerably as it cut down the volume of space they were required to defend and, of course, low flying attacks with their increased accuracy at night were definitely blocked. On the whole the British very evidently felt that the balloon barrages contributed materially to the defense of London and it is apparent that they still feel that way.

Sketch No. 2 shows the complete active defensive system as finally evolved in the London Air Defence Area—the greatest active antiaircraft defensive system ever in actual operation.

The shaded areas show zones covered by antiaircraft artillery guns. The guns were given priority in these zones. The broken line indicates the position of the famous "green line" which marked the boundaries beyond which the guns would not fire, forming a belt in which interceptor pursuit had priority of fire. The solid lines show the patrol routes of the interceptor aircraft. The barrage balloon line was as shown by the heavy blocked line. Coordination between the defending aircraft and the antiaircraft artillery was achieved by giving each a zone to act in and keeping these zones separated. The inner belt of pursuit was so placed



SKETCH NO. 2—ANTIAIRCRAFT DEFENSES OF LONDON, 1918

with the idea that the outer antiaircraft artillery belt would force breaking up of formations and thus give the pursuit a better chance when the attack passed on into its inner zone.

Now let us turn to General Ashmore again and see how he controlled this setup:

> "This arrangement, known as the LADA (London Air Defence Area) control, was, speaking generally, a highly centralized intelligence and command system. A deep zone of country surrounding London, and extending to the sea on the southeast and east, was covered with defence units under my command—gun-stations, searchlights, aerodromes, balloon aprons, emergency landing grounds, coastal and inland watching posts. Each of these was now treated as an observation station, and was connected up by telephone to a sub-control. The sub-controls (there were twenty-five of them) were in their turn connected to the central control in the Horse Guards. This central control consisted essentially of a large squared map fixed on a table, round which sat ten operators (plotters), provided with head phones; each being connected to two or three of the sub-controls. During operations all the lines were kept through direct; there was no ringing up throughout the system.
>
> "When aircraft flew over the country, their position was reported every half-minute or so to the sub-control, where the course was plotted with counters on a large scale map. These positions were immediately read off by a 'teller' in the sub-control to the plotter in the central control, where the course was again marked with counters. An ingenious system of colored counters, removed at intervals, prevented the map from becoming congested during a prolonged raid.
>
> "I sat overlooking the map from a raised gallery; in effect, I could follow the course of all aircraft flying over the country, as the counters crept across the map. The system worked very rapidly. From the time when an observer at one of the stations in the country saw a machine over him, to the time when the counter representing it appeared on my map, was not, as a rule, more than half a minute.
>
> "In front of me a row of switches enabled me to cut into the plotter's line, and talk to any of my subordinate commanders at the sub-controls.
>
> "The central control, in addition to receiving information from outide, constantly passed it out to the sub-controls concerned; so that the commander, say of an antiaircraft brigade, would know, from moment to moment, where and when hostile aircraft would approach his line of guns.
>
> "By my side, in the gallery, sat the Air Force Commander (Brigadier General T.C.R. Higgins) with direct command lines to his squadrons, and a special line to the long-range wireless transmitter near Biggin Hill. This transmitter was used for giving orders to leaders of defending formations in the air, during day time, in accordance with the movements of the enemy, as shown on the control map.
>
> "In order to leave me and my staff free for the purely defensive work, a representative of Scotland Yard was present in the central control during operations, and was responsible for keeping the police and fire brigade informed of events." ("Air Defence"—Ashmore.)

In this great organization and the outlying Northern Air Defence Area, were eventually grouped: 480 guns, 706 searchlights, 245 height finders, and 15,115 officers and men in the ground establishment alone. There were also 15 interceptor pursuit squadrons and 3 barrage balloon squadrons with an additional personnel of some 7,000 and employing several hundred aircraft.

The British are doing everything in their power to prevent air attacks. It is reported that the two existing antiaircraft divisions are being expanded into a total of five —each under the command of a major-general and they are to be grouped under a corps commander with the rank of lieutenant-general. Further, it has been announced, that at the War Office an officer with the rank of lieutenant-general would be appointed Deputy Chief of the Imperial General Staff (Antiaircraft Defense). Thus we see the continuing effect of the lesson as to the necessity for centralized control.

This centralized control is to be given all the means of active defense which Great Britain's immense rearmament program is able to supply. It is interesting to note that in addition to large quantities of antiaircraft artillery and interceptor pursuit some six hundred barrage balloons are being provided for the defense of the London area alone.

This great passive defense program has been administered by the British Home Office, which is the central governing agency for the British Isles. Control of the passive defense program for the civil population and the country at large has not been placed under one of the three governmental departments charged with the conduct of war, but under a newly created civil governmental agency: The Air Raids Precaution Department.

In this country, as in England, it is extremely unlikely that the military services will be called upon to control any such program. It seems certain, however, that they *will* be called upon to furnish expert advice and assistance in planning any passive defense effort that may be undertaken. It is, therefore, desirable that those officers interested in the broad problem of antiaircraft defense, have at least a general understanding of what is involved in such an effort and how it should be controlled in a democratic country, which is threatened with the immediate prospect of air attack. Here is a great storehouse of experience available if we ever awake to realize that antiaircraft defense on a national scale must be provided.

Conclusion

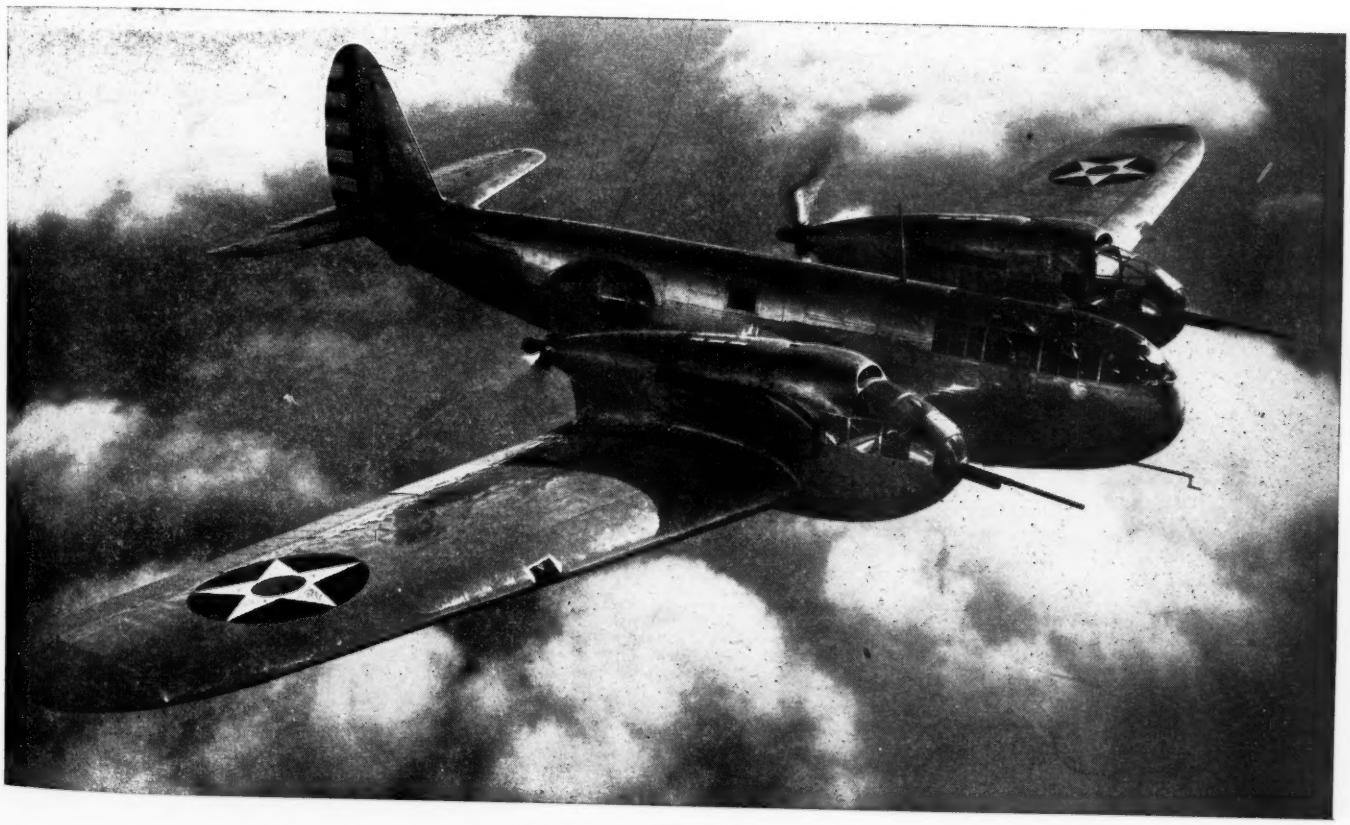
A few pertinent outstanding lessons may be summarized as follows:

First.—Antiaircraft defense is a national problem—not just a local problem.

Second.—Centralized control of all active defensive measures is essential if they are to be employed efficiently and effectively. This centralized control must provide effective methods of coordination between the active agencies of defense.

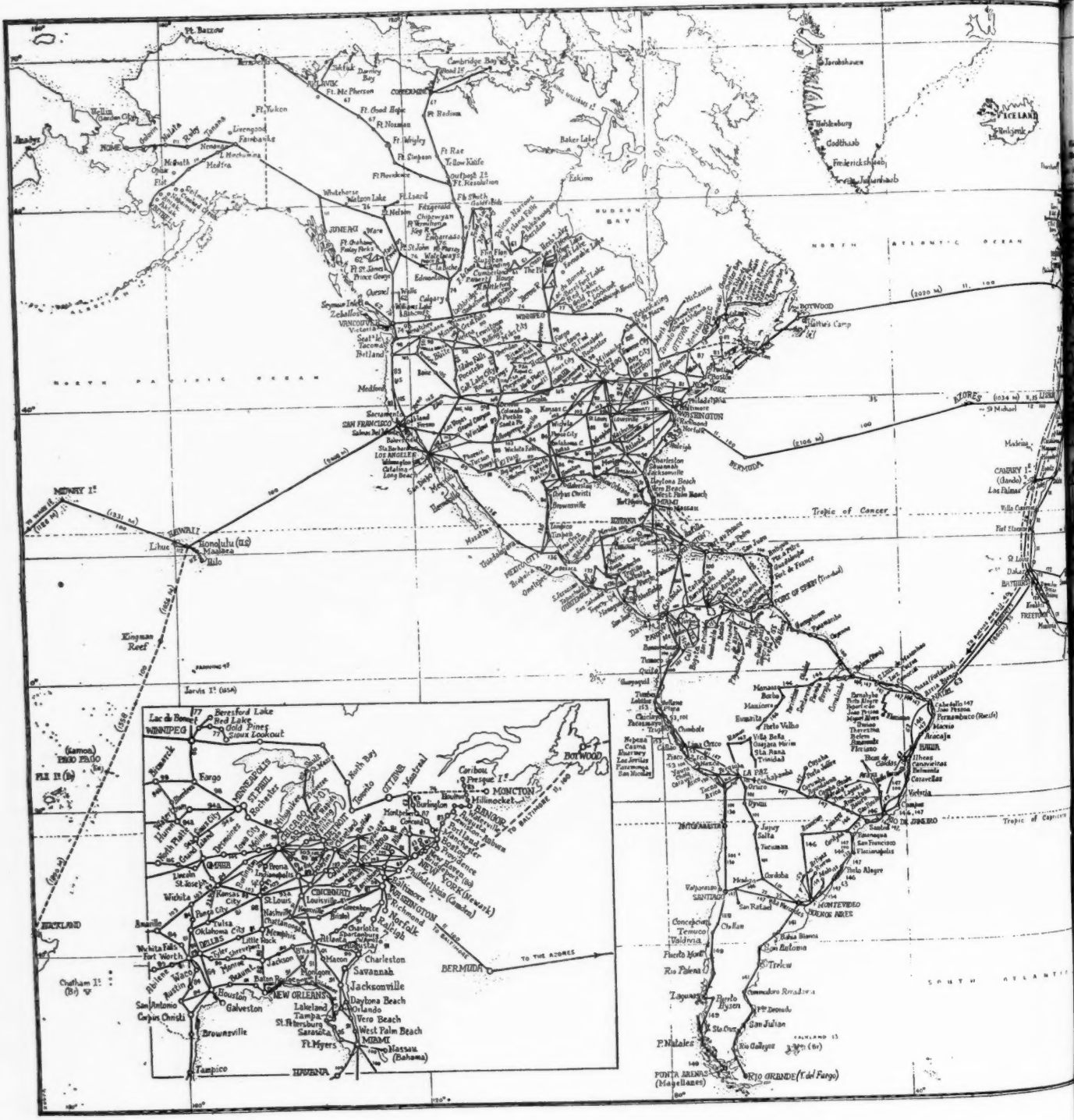
Third.—Barrage balloons are worthy of consideration as a defensive agency—particularly in the defense of certain vital objectives which cannot readily be defended by other agencies.

Fourth.—Complete immunity from air attacks cannot be insured, but preparations in advance must be made to employ all means of defense, thereby reducing the effects of the attack to a minimum.



THE AIRCUDA (Bell Fighter) *Official Photo, U. S. Army Air Corps.*

Air Routes of the W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Ft. Norman
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Ft. Providence
Baker Lake
Eskimo
Whitehorse
Watson Lake
Ft. Nelson
Ft. Liard
Fitzgerald
Chipewyan
Ft. Smith
Goldfields
JUNEAU
Ware
Ft. Graham
Ft. St. James
Prince George
Edmonton
Calgary
Lethbridge
Medicine Hat
Regina
Swift Current
Moose Jaw
WINNIPEG
Kenora
Fort William
Sault Ste. Marie
North Bay
Timmins
Cochrane
Sudbury
Toronto
OTTAWA
Montreal
Quebec
Caribou
Presque I.
MONCTON
Millinocket
BANGOR
Portland
Boston
NEW YORK (Newark)
Providence
New Haven
Hartford
Springfield
Albany
Rochester
Buffalo
Syracuse
Utica
Binghamton
Elmira
Scranton
Wilkes-Barre
Allentown
Reading
Harrisburg
Lancaster
Philadelphia
Baltimore
WASHINGTON
Richmond
Norfolk
Raleigh
Charlotte
Greensboro
Winston-Salem
Durham
Greenville
Spartanburg
Asheville
Knoxville
Chattanooga
Nashville
Bristol
Roanoke
Lynchburg
Charlottesville
Newport News
Williamsburg
Pittsburgh
Youngstown
Akron
Cleveland
Toledo
Detroit
Flint
Saginaw
Bay City
Grand Rapids
Kalamazoo
Battle Creek
Lansing
Jackson
Ann Arbor
Muskegon
Milwaukee
Racine
Kenosha
Madison
Green Bay
Oshkosh
Appleton
Wausau
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Duluth
Superior
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St. Paul
Rochester
Mankato
Fargo
Grand Forks
Devils Lake
Minot
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Great Falls
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Billings
Miles City
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Sidney
Bismarck
Dickinson
Aberdeen
Watertown
Sioux Falls
Yankton
Sioux City
Omaha
Lincoln
Grand Island
Hastings
Kearney
North Platte
Scottsbluff
Cheyenne
Denver
Colorado Springs
Pueblo
Grand Junction
Salt Lake City
Ogden
Provo
Pocatello
Idaho Falls
Twin Falls
Boise
Pendleton
Walla Walla
Yakima
Wenatchee
Spokane
Coeur d'Alene
Kellogg
Missoula
Butte
Helena
Bozeman
Yellowstone Park
Jackson
Rock Springs
Casper
Riverton
Lander
Rawlins
Laramie
Torrington
Scottsbluff
Alliance
Chadron
Valentine
Ainsworth
Norfolk
Grand Island
Hastings
Kearney
North Platte
McCook
Goodland
Hays
Salina
Wichita
Kansas City
St. Louis
Springfield
Joplin
Tulsa
Oklahoma City
Enid
Woodward
Amarillo
Lubbock
Abilene
Sweetwater
Big Spring
Midland
Odessa
Pecos
El Paso
Alpine
Marfa
Presidio
Del Rio
Eagle Pass
Laredo
Corpus Christi
Brownsville
Harlingen
McAllen
Rio Grande City
Victoria
Houston
Galveston
Beaumont
Port Arthur
Lake Charles
Shreveport
Texarkana
Little Rock
Memphis
Jackson
Vicksburg
Meridian
Tuscaloosa
Birmingham
Montgomery
Mobile
Pensacola
Tallahassee
Jacksonville
Daytona Beach
Orlando
Tampa
St. Petersburg
Sarasota
Lakeland
Vero Beach
West Palm Beach
MIAMI
Fort Myers
Nassau (Bahama)
HAVANA
Tampico
Mexico City
Acapulco
Oaxaca
Tuxtla Gutierrez
Villahermosa
Merida
Campeche
Progreso
Chetumal
Belize
Guatemala City
Tegucigalpa
San Salvador
Managua
San Jose
Panama City
Balboa
Colon
Kingston
Montego Bay
Port au Prince
Ciudad Trujillo
Santiago
San Juan
Port of Spain (Trinidad)
Piarco
Georgetown
Paramaribo
Cayenne
Belem
Fortaleza
Natal
Recife
Maceio
Aracaju
Ilheus
Caravellas
Vitoria
Rio de Janeiro
Santos
Sao Paulo
Sao Francisco
Florianopolis
Porto Alegre
Montevideo
Buenos Aires
Rosario
Cordoba
Tucuman
Salta
Jujuy
Mendoza
San Rafael
Bahia Blanca
Trelew
Comodoro Rivadavia
Puerto Deseado
San Julian
Santa Cruz
Rio Gallegos
Puerto Natales
Punta Arenas (Magellanes)
Rio Grande (T. del Fuego)
Concepcion
Temuco
Valdivia
Puerto Montt
Rio Palena
Chillan
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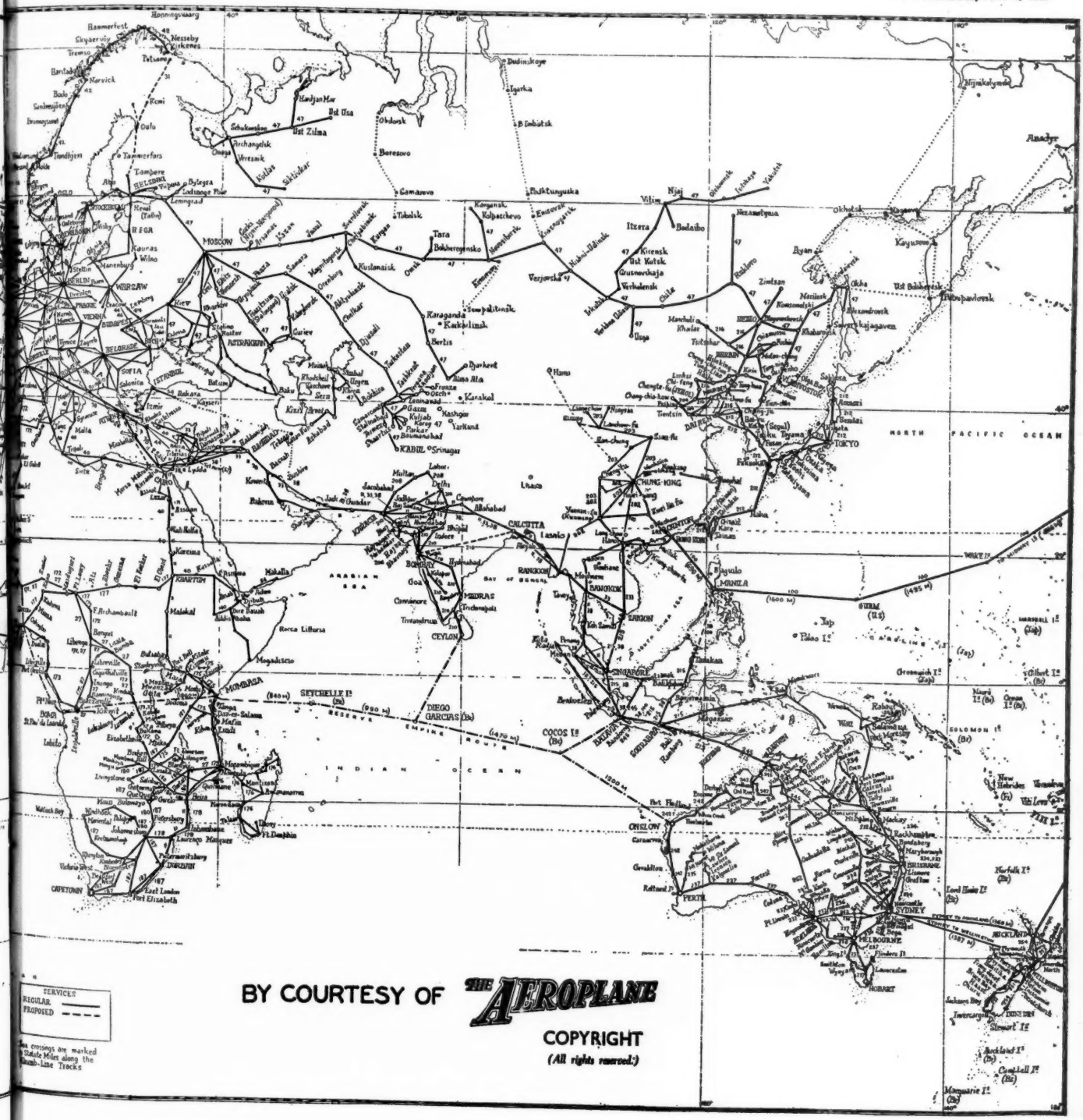
of the World, 1939

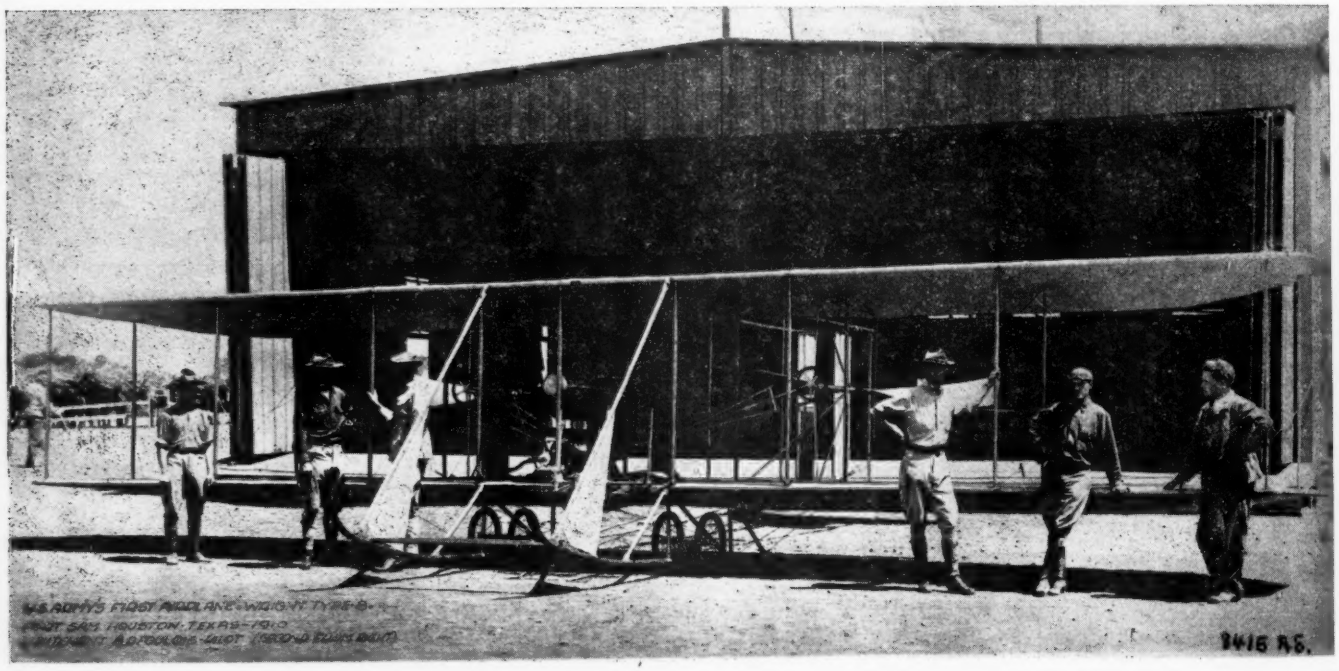


MILITARY NEWS around the WORLD

BY

LT. COL. E. M. BENITEZ, C.A.C.

Progress of Aviation



Official Photo U. S. Army Air Corps.

THE FIRST MILITARY AIRPLANE WHICH WAS DELIVERED IN AN ARMY ESCORT WAGON TO MITCHELL FIELD, 2 AUGUST 1909

THE U. S. ARMY AIR CORPS, 1909-1939

Aviation in the U. S. Army was utilized as early as the Civil War, for during this period observations from balloons were made by civilian aeronauts for the Army of the Potomac. The Army purchased a balloon in France in 1890, and this was used in Cuba during the Spanish-American War.

An aeronautical division was established in the Office of the Chief Signal Officer of the Army on July 1, 1907, and in December of that year the War Department advertised for bids for the construction of an airplane. The Wright Brothers proved they were then the only persons capable of producing an airplane, and their product was delivered at Fort Myer, Va., on August 28, 1908. It was a biplane with a wing spread of about 40 feet and a wing area of some 500 square feet, weighing approximately 800 lbs. The lateral control of the plane was effected by warping the wings. The double elevators and the rudder were supported in front of the wings by an outrigger arrangement. The landing gear consisted of two runners, or skids, and the plane was launched from a monorail.

The power plant of this first airplane, also designed by the Wrights, was a 4-cylinder, water-cooled engine, producing 25 horsepower at 1400 revolutions per minute and driving two 8½-foot wooden propellers by means of gears and chains. The propeller speed was about 400 revolutions per minute.

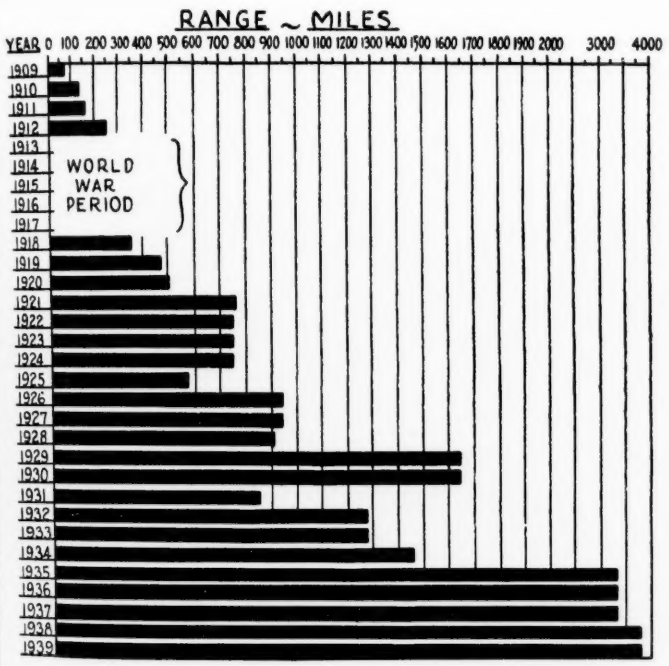
After many tests and several discouraging accidents, the Board of Officers, appointed to consider the purchase of this airplane, made a recommendation to that effect on August 2, 1909, and the Chief Signal Officer of the Army approved this recommendation on the same date—and which is considered the birthday of the Army Air Corps.

The requirement that the airplane attain a speed of 36 miles per hour was exceeded by about 5 miles per hour. Other specifications, namely, that it should be able to remain in the air for an hour with two occupants and that it should have a range of over 125 miles, were also satisfied. Another requirement specifying that the plane should lend itself to transportation in an Army wagon—now considered a rather unique provision—was also fulfilled. The Wrights

received $25,000 for their airplane, plus a bonus of $5,000 for its having exceeded the required performance.

On March 3, 1911, Congress for the first time specifically appropriated money for aviation—$125,000. By September 30, 1913, Army aviation had grown to 17 airplanes, with a personnel of 23 officers and 91 enlisted men.

The Aviation Section, Signal Corps, of the Army was created on July 18, 1914, with 60 officers and 260 enlisted men authorized, and on September 1st of that year the 1st Aero Squadron, comprising 16 officers, 77 enlisted men and 8 airplanes, was organized at San Diego, Calif. This Squadron, on March 15, 1916, began operations with the Punitive Expedition in Mexico.



AIRCRAFT RANGE OVER 30 YEAR PERIOD

Due to the influence of the World War, into which we had not then entered, the Congress passed the National Defense Act of June 3, 1916, which authorized for the Aviation Section, Signal Corps, a personnel strength of 148 officers and 4,000 enlisted men, and provided for an Officers' and an Enlisted Reserve Corps. Upon our declaration of war with Germany, on April 6, 1917, Army Aviation consisted of 65 officers (35 of whom were flyers), 1087 enlisted men and 55 airplanes.

While the multiplicity of facts concerning the U. S. Army's participation in the World War is too great to cover here even briefly, a few of the most interesting ones will be set down.

When we entered the World War no machine guns had as yet been mounted on our planes.

During the first eight years of its existence, 1909-1916, a total of 142 airplanes had been delivered to Army Aviation. The French Government presented us a program calling for 16,500 modern airplanes for the first half of 1918.

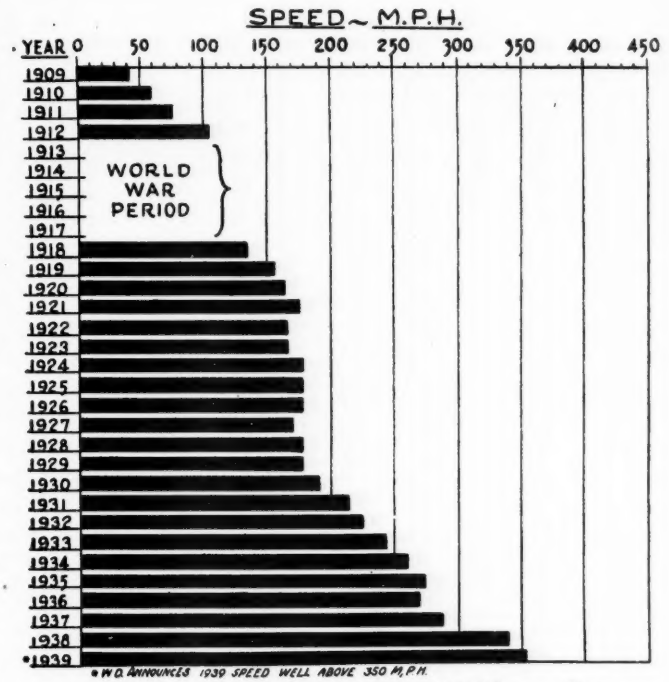
On July 24, 1917, Congress appropriated $640,000,000 for Army Aviation, the largest appropriation which had been made up to that time for a single purpose by an American Congress.

Flying schools were established at various points, pretty well covering the whole country, and ground schools were operated at a number of the colleges and universities. Nearly 15,000 flying cadets received training in this country, and about 1,800 in Europe. By March, 1918, our Army Aviation strength was 11,000 officers and 120,000 enlisted men.

For production as a Day Fighter and Bomber, we adopted the British DeHavilland, and the American Liberty engine—our outstanding aviation contribution—was installed therein. Contracts for 5,000 DeHavillands were let in September, 1917, and by May, 1918, 155 of them had been delivered and 49 had been shipped overseas. At the signing of the Armistice, sufficient parts for 70 Handley-Page Bombers were available for us in England, and we were arranging with the Italian Government for the manufacture of Caproni Bombers in this country.

At the time of the Armistice, we had 757 pilots, 481 observers, with 740 planes and 77 balloons at the front, and 1402 pilots, 769 airplanes and 252 balloon observers had entered the Zone of Advance.

Our aviators were credited with the destruction of 491 enemy airplanes, of which 462 were accounted for by 63 aviators. We had 43 squadrons at the front at the time of the Armistice, and of these less than 25 per cent were equipped with American built airplanes.



AIRCRAFT SPEED OVER 30 YEAR PERIOD

Aviation activities were divorced from the Signal Corps in May, 1918, and expanded into two new departments—the Bureau of Military Aeronautics and the Bureau of Aircraft Production. Upon the termination of the War, these two departments were consolidated into the Air Service.

The Army Reorganization Act of 1920 provided for 1516 officers and 10,300 enlisted men for the Air Service, and the Air Corps Act of 1926 authorized a "Five-Year Pro-

gram," contemplating at the termination thereof a personnel strength of 1,650 officers, 15,000 enlisted men, with 500 flying cadets, and equipment comprising 1800 serviceable planes.

From the end of the World War to the present time, the Air Corps has pioneered in numerous aviation activities.

TWENTY YEARS OF TRANSATLANTIC FLYING

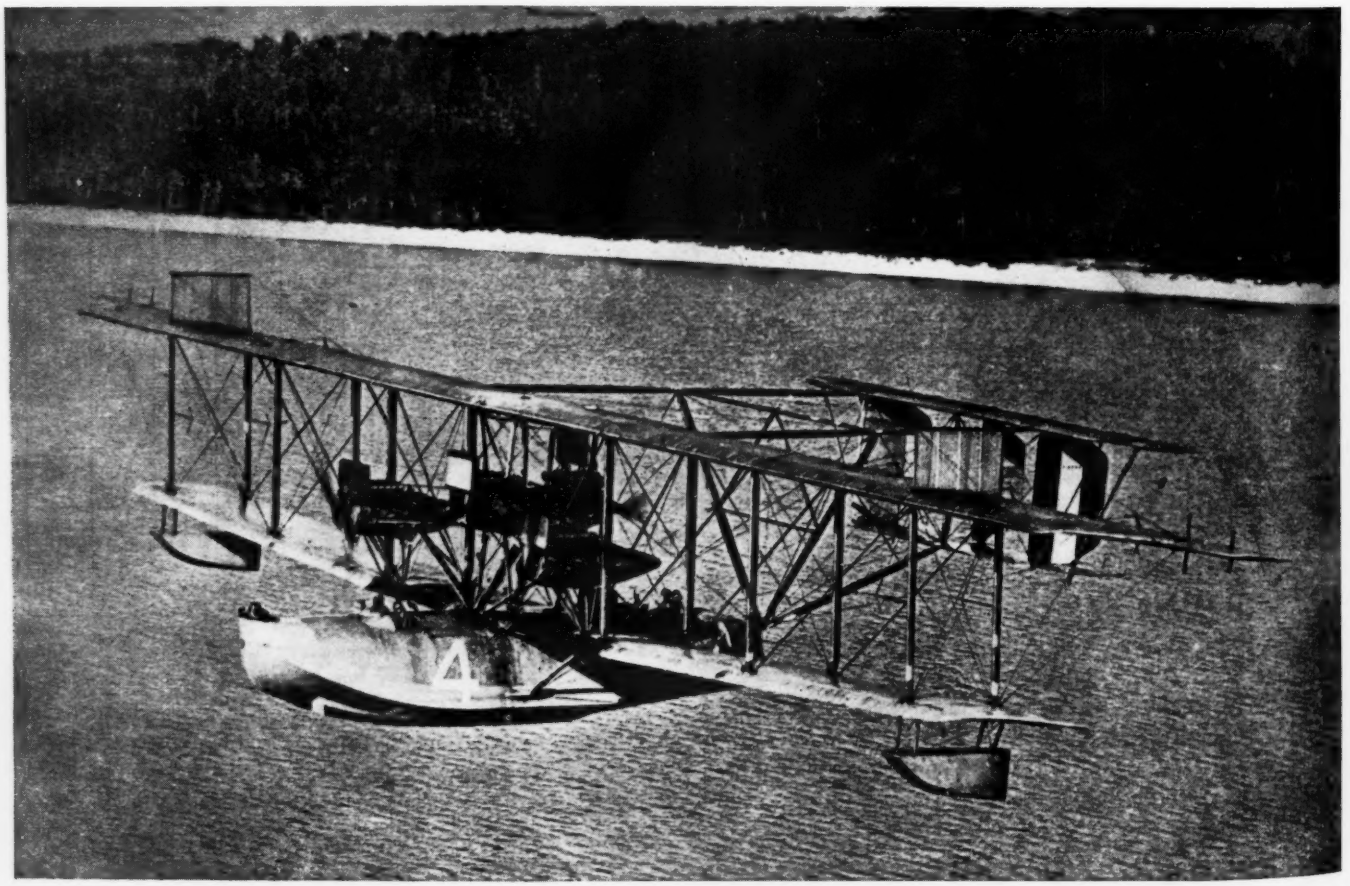
A score of years have passed since the American naval seaplane NC-4, manned by a crew of six, blazed the trans-oceanic airway trail to achieve fame as the first heavier-than-air machine to fly the Atlantic. Since then many daring fliers have made the crossing, but all these earlier attempts stand out in marked contrast when compared with the recent successful round-trip flight of the Yankee Clipper, flagship of the trans-Atlantic passenger and express service of the Pan American Airways.

Honors for the first non-stop flight across the Atlantic belong to two Britons, John Alcock and A. W. Brown, who took off from St. Johns, Newfoundland, for Ireland, almost a month after Lieutenant Commander Albert C. Read and his crew in the NC-4 flew out of Trepassey Bay, in Newfoundland, on May 16, 1919, for the Azores. The first mentioned flight was a hazardous adventure in a war-type landplane, but that of the U. S. Navy plane was a well-planned test to prove the feasibility of flying ships long distances over water—a forerunner of the present day mass flights in which whole squadrons of Navy planes are ferried to distant stations.

At the Trepassey takeoff, the NC-4 was accompanied by two sister-ships, the NC-1 and the NC-3, which were forced down en route. The NC-4 reached Horta on the afternoon of May 17, after covering the 1,200 nautical miles in fifteen hours and eighteen minutes at something less than 80 miles an hour! After successive hops to Ponta Delgada, also in the Azores, Portugal and Spain, the flying boat finally reached Plymouth, England, on May 31, 1919. The total airline distance, beginning with the start from Rockaway Beach, Long Island, on May 8, and including stops at Cape Cod and Halifax, was 4,108 miles.

But it is in comparisons of the NC-4 and the Yankee Clipper that one best realizes the tremendous growth of aviation. This decided advancement was even more pronounced as the Clipper retraced the Southern route of the NC-4. On the flight from Trepassey to Horta, the NC-4 did a little better than a mile a minute; the Clipper flew from Baltimore to Horta, a distance of 2,880 miles, at 165 miles an hour. The NC-4 had a crew of six, while the Clipper had a complement of 21 men, the largest number ever carried in a heavier-than-air craft on a transatlantic flight. As a navigation aid the NC-4 received radio reports from destroyers stationed along the route, but the Clipper charted her own course.

In the picture below the historical plane, NC-4, is shown winging her way over water during a flight in 1919. Its



Wide World Photo

THE NC-4, 1919

wing span was 126 feet and the hull length 45 feet. Four water-cooled 12-cylinder V-type Liberty motors of 400 horsepower each, gave the 28,000-pound flying boat a cruising speed of 77 miles an hour. Its maximum speed was 95 miles an hour. Note the "forest" of struts and exposed positions of crew stations.

The 74-passenger ultra-streamlined Yankee Clipper is a giant monoplane-type, all metal, flying boat, has a wing spread of 152 feet and measures 109 feet from nose to tail. Its clean, air-flow lines are in decided contrast with those of the NC-4. Powered by four 1,500 horsepower Wright Cyclone engines, the 42-ton winged hotel has a cruising speed of 150 miles per hour and a top speed of 180 miles per hour.

On 9 July, 1939, the Clipper landed nineteen passengers from all parts of the United States at Southampton, England, after flying from Port Washington, L. I., in twenty-seven hours and twenty minutes, including the time for stops at Shediac, New Brunswick; Botwood, Newfoundland and Foynes, Ireland. The Clipper was in the air 19 hours, 23 minutes.

Though the majority of those who crossed in the flying boat were newspaper executives who made the trip as guests of the line, several were paying passengers. Thus the crossing was considered the first regular commercial flight across the Atlantic by the direct northern route, as contrasted with the southern route via the Azores and Lisbon to Marseilles.

The cost of air passages to Europe have been announced as $375 one way and $675 for a round trip. The one-way fare compares with $316 for a first-class ticket on the liners *Queen Mary* and *Normandie*.

ARGENTINA

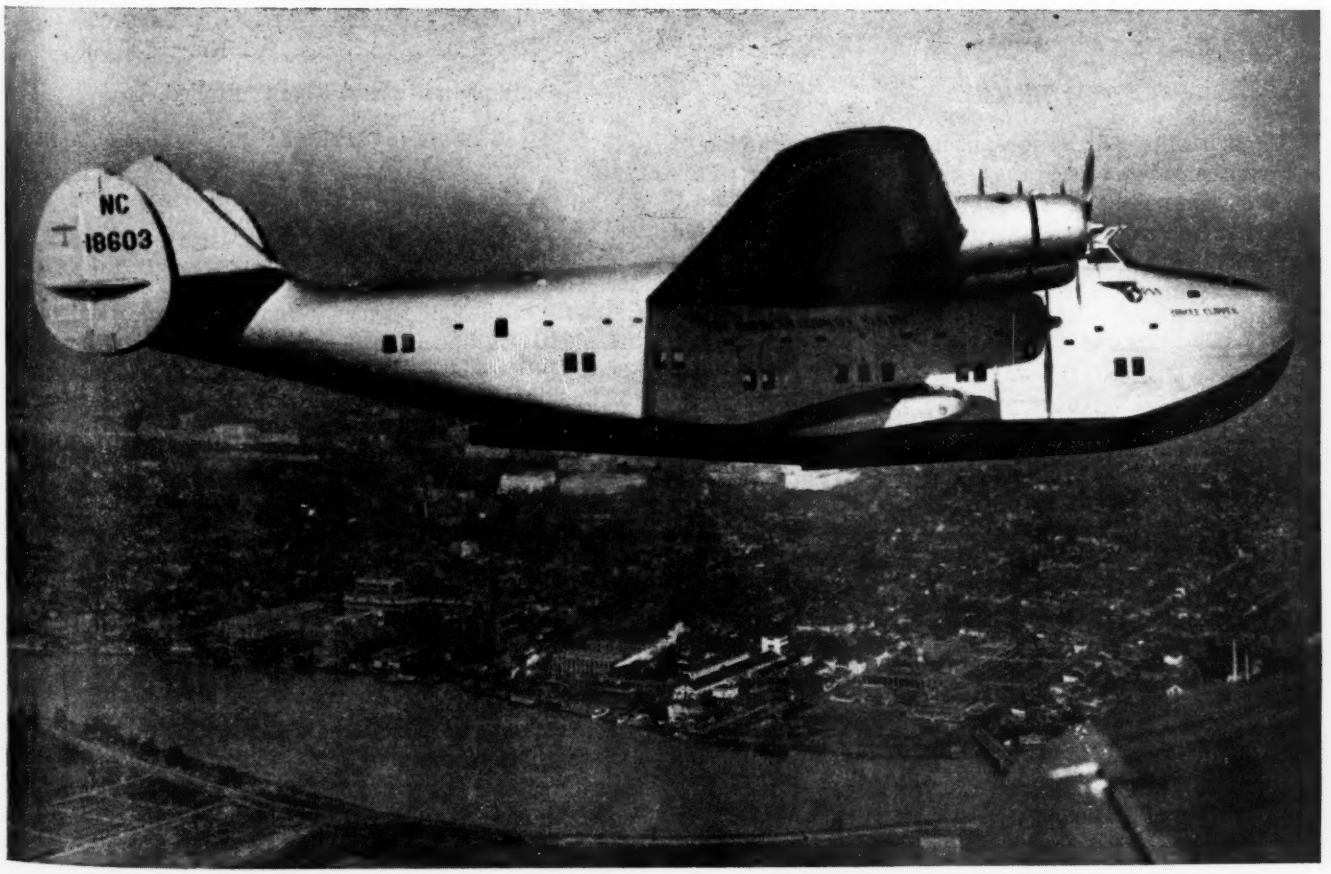
In Argentina, as in the majority of Latin American countries, most of the child-health work is done by the Government. Argentina was the first Latin American country to establish a juvenile court and related measures for the care of delinquent children, following in general the experience of the United States.

(*Bulletin of the Pan American Union*, June 1939)

BALTIC STATES—ESTONIA, LATVIA AND FINLAND

The Baltic States are reluctant to accept a Soviet guarantee modeled on British guarantees to Poland, Rumania, Greece and Turkey. These three small states had been provinces of the Russian Empire—Estonia and Latvia since 1721, Finland since 1809—until 1918-1924, when the great powers acknowledged their independence.

While the Baltic countries want, above all, to preserve their neutrality, and have no desire to become vassals of Nazi Germany, they are also unwilling to accept Soviet guarantees, fearing that these guarantees might either pro-



THE YANKEE CLIPPER

Wide World Photo.

voke German invasion of their territory or give Russia a pretext for "preventive" occupation.

(*Foreign Policy Reports*, 15 July 1939)

BELGIUM

Air Defense:

Under a law passed on the 27th of December the Minister of National Defence, General Denis, is authorized to spend 600,000,000 francs (about $21,000,000) on active and passive air defense. This sum is included in the Extraordinary Budget, and will be utilized to provide for:

A considerable increase in the strength of fighter aircraft in the Military Air Service.

Passive air defense measures, including the provision of air raid shelters.

The formation of a new force of antiaircraft artillery and searchlights. This new force will be distinct from, and not an addition to, the regular antiaircraft artillery of the "Defense Terrestre contre Aeronefs" (D.T.C.A.) which is an integral part of the army.

The role of the new force will be the defense of towns and factories, and its personnel will be recruited locally on lines somewhat similar to those which governed the old "Garde Civique" of pre-war days, and they will be required to attend a prescribed number of drills each year like the Territorial Army of England.

(*Journal of the Royal United Service Institution*, May 1939)

BRAZIL

English shipyards have commenced the construction of destroyers contracted for at the beginning of this year. Payment for them will be effected in part with materials.

Although Brazilian shipyards have undergone a rapid expansion during the last few years, Brazil will have to continue purchasing the armament for her ships from foreign countries.

(*Revista de Marina*, Peru)

CHILE

Since 1919, social insurance legislation has been adopted in Chile, Argentina, Brazil, Colombia, Peru, Cuba, Ecuador and Uruguay and is under discussion in other countries. Chile has the most comprehensive law, enacted in 1924—eleven years before the passage of the Social Security Act in the United States.

(*Bulletin of the Pan American Union*, June 1939)

COLOMBIA

The Government of Colombia has initiated a campaign to promote the construction of rural dwellings. Long-term mortgage loans for the construction of dwellings for agricultural workers will be granted by the Territorial Credit Institute of Bogota.

(*Bulletin of the Pan American Union*, June 1939)

COSTA RICA

The Eighth Pan American Child Congress will meet in San José, next October. The conferences discuss a wide range of subjects, including medical care of children, child hygiene, education, legislation and social welfare.

(*Bulletin of the Pan American Union*, June 1939)

DENMARK

Expansion of Danish Air Service:

As a result of the Czechoslovakian crisis the Danish Naval and Military Air Services are to be improved. The moneys for defense services intended to be spread over the next five years are now to be made immediately available.

No great advance has been made in the military air service during 1938, nor in the naval air service. The latter has, however, placed a fairly substantial order with the Fairey Aviation Company for the torpedo plane.

The voted credits for aviation for 1939 and 1940 were as follows:

Civil	Kn. 790,892
Military	Kn. 2,000,000
Naval	Kn. 2,590,000

Air raid precautions are being studied.

(*Royal Air Force Quarterly*, April 1939)

DOMINICAN REPUBLIC

The capital of the Dominican Republic, now called Ciudad Trujillo but formerly known as Santo Domingo, is the oldest European settlement in the New World. The bones of Columbus rest in the beautiful cathedral, begun in 1523.

FRANCE

On 6 June 1939, General Maurice Gustave Gamelin became Supreme Commander of France's defense forces.

A cabinet decree concentrated in him more military power than ever before granted in the modern French Republic except to his sole superior, Premier Deladier. Land, sea and air forces are unified under Gamelin's command.

Other ministerial decrees strengthened preparations for wartime defenses. One would bring the ports of Le Havre and Bordeaux under immediate and strict military control in an emergency. Another provided credits for continued building up of reserve war supplies and a third tightened disciplinary rules for the merchant marine. Few details were disclosed.

Tank developments during 1937:

The following details of the characteristics of employment of the new French "D" tanks are based on the official provisional instructions.

The machine is a medium tank of 13-15 tons weight, carrying armour of minimum thickness of 20-mm and armed with a 47-mm gun and two machine guns. It has a radius of action of 50 miles and a maximum speed of 12 m.p.h. and average speeds of 5 m.p.h. in action and 2 to 3 m.p.h. on rough country. It carries a short-wave wireless set with a range of 3 to 6 kilometers.

The role foreseen for these "D" tanks is to accompany infantry in attack and to deal with hostile automatic weapons. It is required that they be closely followed by mechanized artillery to put down relays of fire ahead of them and neutralize or destroy antitank guns not dealt with during the preliminary bombardment. They are divisional weapons and a company of them will normally attack on a front of 600-800 yards, i.e., on an infantry battalion front, though for secondary or holding attacks the front may be double the above, corresponding to that of a regiment. Normal intervals between tanks should be not less than 50 yards. The normal attack *scheme* will show infantry with accompanying tanks echeloned to a depth of 500 yards, preceded by maneuver tanks in two echelons in a depth of 800 yards, the leading echelon accompanied by the mechanized artillery, the whole preceded by artillery barrage fire, 600 yards in depth, under the moving protection of which the area of ground to be captured will be over-run, mopped up and consolidated.

(*Bulletin Belge des Sciences Militaires*)

Navy:

The French submarine force comprises in service 30 ocean submarines of 1,500-2,000 tons in addition to the giant Surcouf of 3,900-4,350 tons, nine rebuilt submarines of the Morse type of 1,000-1,420 tons that are efficient for long-range patrol work, 31 coast defense submarines of 600-800 tons, and six submarine minelayers of 670-910 tons; altogether 77 units, all in good fighting trim. There are in building stage, 5 ocean-going submarines of improved type of 1,610-2,300 tons, and 7 enlarged coastal submarines three of which will be available this year, in addition to a minelayer.

Four other coastal submarines have just been ordered under the 1939 program. Thus, in service or building, the French Navy list includes 93 underwater craft.

(*United Services Review*, June 1, 1939)

Compulsory Service:

On 31 January the Chamber unanimously adopted two important measures.

The first authorizes the maintenance of the two years compulsory military service which was temporarily imposed in 1936 to meet the shortage in the annual classes in the lean years 1936-1940. The unsettled conditions in Europe and the increase in German military effectives have made it necessary for steps to be taken to maintain the French Army at its present strength and to increase the Air Force and antiaircraft defense units. The new *projet de loi*, however, authorizes the Minister of National Defense to return gradually to the old calling up age of 21 instead of the earlier age of 20 gradually imposed since 1936. The second *projet de loi* alters the periods of reservists' training and the Minister is now to have power to call up reservists during a crisis for any period up to three weeks. Exemptions will not be given, and postponements only in very exceptional circumstances.

(*Journal of the Royal United Service Institution*, May 1939)

Proposed new transatlantic air line and air base:

It is reported that the French Government proposes to inaugurate, possibly next spring, an air line—Paris, Boston, Baltimore, New York—via Bordeaux and the Azores, with branch lines to Berlin, Rome, Athens and Alexandria. Bordeaux-Merignac airport has been selected as a test base for transoceanic aircraft, and, as its share towards the cost of organizing the base, the Conseil Generale de la Gironde have voted three million francs. Work on runways for heavy aircraft is to be started, two hangars capable of accommodating aircraft of 100 feet span are already available, and two others are under construction. The runways will be sited so that aircraft can take off and land all the year round even when visibility is bad.

Training of pilots for the air force:

In order to increase the output of pilots for the air force the Ecole de L'Air has duplicated the Flying School of Cadet Officers at Avord by a second school at Romilly, which started working six months ago, and are taking over five finishing schools from Aviation Populaire (at Amberieu, Angers, Le Bourget, Clermont-Ferrand and Nimes), which will be affiliated to the *ab initio* flying training school for Noncommissioned officers at Istres for men who have been taken on for the two years' normal conscription or who have signed on for longer periods.

(*Royal Air Force Quarterly*, April 1939)

GERMANY

The German Army is making strenuous efforts to bring its reserves of trained manpower up to the level of those of France and hopes to add 300,000 trained men to its reserves during the coming year. In accordance with a decree issued by General Keitel, Chief of the German High Command, and Dr. Frick, Minister of the Interior, all men born in 1913 or earlier who have not yet reached the age of 35, but were too late to serve their two-year period of military conscription, will be given twenty-eight weeks' special training. They will then become reservists of the second class, and as such, receive thirty-six weeks' further training. In some cases these two periods will be practically continuous. On reaching the age of 35, men are drafted to the Landwehr, where they serve until 45 years of age, and if living in East Prussia will receive sixteen weeks' training. The provision for extra training for men of the Landwehr living in East Prussia shows that the lessons of 1914, when the Landwehr did splendid service before and during the battles of the Masurian Lakes, have not been forgotten. The total strength of the 1906 and 1907 classes may be estimated at 600,000 men. It appears that, by the end of this summer, at least half of this number should be added to the trained reserves of the German Army.

(*Journal of the Royal United Service Institution*, May 1939)

Antiaircraft Artillery Organization:

A recent press report describing the tasks of German Antiaircraft Artillery stated that a Flak regiment consists of three brigades, two brigades with guns of mixed caliber and one brigade of searchlights.

Recruit Depots:

In a press report of a visit to the Recruit Depot at Schonewalde it was stated that German Air Force Officer cadets now receive their first six months disciplinary training in the recruit depots along with other recruits. They receive the same training, but as prospective officers they are expected to be outstanding during their training.

(*Journal of the Royal United Service Institution*, May 1939)

According to the Italian review "Ala d'Italia," the German air forces comprised by the end of 1939:

250 escadrilles first line, each of 9 planes in service and 3 in reserve
700 training ships at training centers
700 training ships at schools

available for military purposes. Added to this are the reserves of the second and third classes.

(*Revue d'Infanterie*, June 1939)

The large units are strongly provided with antitank arms. Each infantry regiment has a motorized antitank company of 4 sections of 3 pieces each, thus making a total of 36 pieces for the three infantry regiments of the division.

There is an antitank detachment in each division which consists of a headquarters, a communications section and three antitank companies.

Each company has 3 sections of 4 pieces each—37-mm tractor-drawn; making a total of 36 guns. This gives the infantry division (regimental companies plus division detachments) a total of 72 antitank guns.

The German infantry division is well trained in antitank defense.

(*Revue d'Infanterie*, January 1939)

On 22 May 1939, representatives of Germany and Italy signed in Berlin the following pact:

Article One:

The contracting parties will remain in constant contact with each other in order to arrive at an understanding on all matters touching their common interests or the general European situation.

Article Two:

Should the common interests of the contracting parties be endangered by international events of any sort whatsoever they will immediately enter into consultations concerning the measures to be taken for safeguarding these interests.

Should the security or other essential interests of one of the contracting parties be threatened from the outside the other contracting partner will give the threatened party his full political and diplomatic support in order to remove this threat.

Article Three:

If, contrary to the wishes and hopes of the contracting parties, it should happen that either of them should become involved in military entanglements with one other power or with other powers, the other contracting party will immediately rally to his side as ally and support him with all his military resources on land, at sea and in the air.

Article Four:

In order in any given case to make sure that the duties of an ally undertaken in accordance with Article Three shall be carried out speedily, the governments of the two contracting parties will further deepen their co-operation in the realm of the military and in the realm of war economy (Kriegswirtschaft).

In a similar manner the two governments will also constantly arrive at understandings concerning other measures necessary for the practical execution of the provisions of this act.

The two governments will form standing commissions for the purposes indicated above under Articles One and Two. These commissions shall be under the jurisdiction of the two foreign ministers.

Article Five:

The contracting parties obligate themselves now, in the event of a war conducted jointly, to conclude an armistice and peace only in full agreement with each other.

Article Six:

The two contracting parties are conscious of the importance which attaches to their common relations to powers with whom they are on terms of friendship.

They are determined in future, too, to keep up these relationships and jointly to give them a form consonant with the mutual interests that bind these powers.

Article Seven:

This pact becomes effective immediately from the moment of signature.

The two contracting parties are in agreement to fix the first period of its effectiveness for 10 years.

They will come to an understanding in sufficient time (Rechtzeitig) before expiration of this period concerning the extension of the effectiveness of the pact.

According to information reaching Soviet military circles from French sources the German secret police (Gestapo) has intensified its activities against those higher officers of the German Army, who do not thoroughly subscribe to the officially espoused theory of "Blitzkrieg"—the lightning war. Recently the following officers have been retired from active service in the German Army: General Liebmann, Commander of the War Academy; General Geyer, Commander of the V Corps; General Loeb, Commander of the aviation school; General Stuelpnagel of the air corps; General Quade, and 30 other unnamed higher officers.

(*Krasnaya Zvyezda*, 30 May 1939)

Helgoland, the tiny islet that figured so prominently in the World War is, according to reports, being refortified. This German Gibraltar is a flat-topped triangle of red sandstone, rising some two hundred feet above the water, about one mile long and one-third of a mile at the widest part.

Strategic Helgoland

Section 115 of the Treaty of Versailles provided that all the fortifications and military harbors on Helgoland and Dune Island—a sandspit a quarter of a mile away—be destroyed by German labor at German expense under the supervision of the Allies. It also provided that "these fortifications shall not be reconstructed, nor shall any similar works be constructed in the future."

Under the Wemar Republic, Helgoland was simply a summer resort. Rumors of fortifications were confirmed in 1936 and since that time the veil of secrecy has become increasingly heavy.

GREAT BRITAIN

Militia Force:

The New Militia or Reserve is only the beginning of a larger army which in the future must be on a million men basis, available at once, plus reserves. Here is how the compulsory call-up is likely to pan out:

1939—Men registered, 300,000 and 200,000 called up
1940—450,000 and 250,000
1941—450,000 and 300,000

The million men standard will resemble something like these figures by the end of the year:

Regular Army	240,000
Regular Reserve	144,000
Supplementary Reserve	60,000
Territorial Army	460,000
First Militiamen	100,000
Total	1,004,000

Next year a million and a quarter, and in 1941, a million and a half.

(*United Services Review*, May 18, 1939)

Air Force:

The 1940-41 aviation budget of 205,951,000 pounds is the largest in history. By 31 March, end of the fiscal year 1938-1939, Great Britain had reached the objective: 1,750 first class planes. The plans call for 2,730 first class planes by 31 March 1940.

In 1934, aviation had a strength of 30,000, the latest figures give the air force a strength of 96,000 men; the 1939-1940 budget provides for an increase of 22,600, bringing the total strength to 118,600.

(*La France Militaire*, April 10, 1939)

Announcement was made on 4 April of the formation of the Royal Armored Corps. To it belong the eighteen regiments of the cavalry of the line, which are already or about to be mechanized, as well as all the battalions of the Royal Tank Corps, and this amalgamation covers Territorial as well as Regular units. All regiments are to keep their old designations and to retain their badges. For the present, too, officers will remain or be gazetted to separate regimental lists as heretofore, unless and until they voluntarily accept liability to serve elsewhere.

Soldiers, however, enlisting into the Royal Armored Corps will be liable to serve in any Regular unit of the Corps, either at home or abroad.

(*Fighting Forces*, June 1939)

Administrative control of the Fleet Air Arm was assumed by the Admiralty on 24 May 1939. As from that date the administration will be brought as far as possible into line with the rest of the Navy.

The naval personnel in the Fleet Air Arm will be supplemented by Royal Air Force officers and men on loan until such time as full requirements can be met from naval sources.

The Air Ministry will be responsible for the initial flying training of pilots before they begin their specialized naval flying training. The Admiralty will be responsible for all other training of personnel of the Fleet Air Arm and this specialized training will be done as far as possible at naval air stations.

(*The Aeroplane*, May 31, 1939)

The Air Ministry of Supply reports that the output of new aircraft is now approaching a rate of about 1,000 a month.

(*United Services Review*, June 22, 1939)

Australia

A conference of British, Australian and New Zealand military officials was held in April to prepare for naval

and air defense and to accelerate production of airplanes. Australia is building an air fleet of 212 first-line planes for defense of its coasts, and is increasing its pilot force by 900 per year. The new government that went into office 7 April plans to borrow immediately half of its 26,000,000 pounds defense program for 1939-1940.

(*Foreign Policy Bulletin*, June 2, 1939)

Canada

Canada's war-potential is, actually, very high and her industries are more fully developed than those of any other Dominion. Unlike Australia, moreover, her factories are only about a week's sea voyage from British western ports. In the event of war, therefore, Canadian industries, which are situated in a relatively safe area would probably be of immense assistance to the Imperial war output. The organization of these industries for war and the direction of their activities into the most suitable channels has already begun.

Royal Canadian Air Force:

It was announced from Ottawa on 26 January, 1939, that about 13,000,000 pounds (about $63,000,000) had been allotted for defense purposes, almost half of which was earmarked for the Royal Canadian Air Force. Eighty-three new aeroplanes are to be acquired, sixty-four for the Royal Canadian Air Force and the balance for the Non-Permanent Air Force. The regular personnel is to be increased by 14 officers and 217 other ranks, bringing the total strength to 269 officers and 2,043 other ranks.

The Royal Canadian Air Force has been reorganized on service lines. The formation of units of the Non-Permanent (Civilian) Air Force has made considerable progress. About 1,500,000 pounds ($7,300,000) has been allotted for the training of pilots; and training and bombing machines are being manufactured in Canada. Coastal air bases have been established on the Pacific and an air station has been set up on the Island of Anticosti in connection with the defenses of the St. Lawrence. According to press reports, it is the intention ultimately to have 23 Air Force units with a total of 520 machines, service and training.

Army:

On land, the Canadian defense forces have not yet been developed to any degree of strength and are almost negligible in quantity—though high in quality—in relation to the size of the country and the growth of its population and wealth. The Active Militia, Permanent and Non-Permanent, forms the first line of the military defenses. It is supported by officer reserves and a reserve militia. The Non-Permanent Active Militia corresponds, more or less, to the Territorial Army at home and constitutes the bulk of the military forces of Canada. The strength of the Permanent Active Militia is about 4,000 of all ranks; the Non-Permanent Militia numbers about 45,000 of whom about 14,000 usually attend camp for an average period of about eight days.

During the last two years, the Non-Permanent Active Militia has been reorganized on modern lines; redundant cavalry and infantry regiments have been disbanded, amalgamated, or formed into armored-car, tank, machine-gun or artillery units; and the period of training is to be extended. In addition, necessary auxiliary units for a mechanized force have been formed. A Tank School has been opened at London, Ontario.

When it is recalled that Canada enlisted over 600,000 of all ranks for service during the Great War, the cadre of the Permanent Active Militia, whose duty it is to provide instructors and to staff the military schools and courses of instruction for the National Army, seems very small.

This year's vote for the Army is about 4,000,000 pounds ($19,400,000)—an increase of nearly 1,000,000 pounds on last year's estimates. Of this 450,000 pounds will be spent on new construction; 700,000 pounds to pay for arms and ammunition ordered and due for delivery during the financial year, while new arms and ammunition, costing 600,000 pounds will be ordered during 1939-1940.

(*Journal of the Royal United Service Institution*, May 1939)

GREECE

Greece, which allowed France and Great Britain to use its highly strategic harbors during the World War, is on the whole anti-Italian in sentiment; fears that Italy may use Albania as a base for attack on Greek territory; and resents Italy's control of the Dodecanese Islands, which have a predominantly Greek population. King George II, restored to the Greek throne in 1935 with British aid, favors cooperation with Great Britain, but his influence may be counterbalanced by that of Premier General Metaxas, who received his military training in Germany, although the Premier has denied that he has any pro-German sympathies.

Greater Germany takes over 40 per cent of Greek exports, a large part of which consists of tobacco.

(*Foreign Policy Reports*, 15 July 1939)

ITALY

Italian Air Strategy:

Marshal Balbo has written recently an article on air warfare in which he once again asserts Italy's belief in the Douhet theory and speaks of "attacks in mass" and the "moral destruction" of the enemy, but describes the defeat of the enemy air force by attacking aircraft factories, depots and similar establishments as being one of the initial tasks of the Italian Air Force.

Marshal Balbo points out in his article that Italian air strategy has not been influenced by the Abyssinian War, the Spanish Civil War or the Sino-Japanese War, and states that an air force has not been employed in a primary role.

(*Journal of the Royal United Service Institution*, May 1939)

Navy:

The Italian Fleet at present consists of the following units:

4 Battleships
1 Aircraft carrier
7 Heavy cruisers

15 Light cruisers
104 Destroyers
86 Submarines
114 Torpedo boats

439,000 Tons

Under construction:

4 Battleships
50 Destroyers
22 Submarines
80 Torpedo boats

224,000 Tons

(*La France Militaire*, April 28, 1939)

On 29 May the Albanian armed forces were incorporated into the Italian forces.

In June the Italian General Staff announced the creation in Albania of two army corps, totalling about 60,000 men.

Marshal Badoglio is supervising the execution of plans which will make Albania into a powerful bridgehead across the Adriatic. Eight hundred million lire have been appropriated to build new roads—strategic roads.

(*New York Times*, June 25, 1939)

MEXICO

Rapid progress is reported on the construction of a pier, at the port of Progreso in the Mexican state of Yucatan. The pier is being built by a Danish concern and the contract specifies that it must be finished in December 1939.

Progreso, a shallow open roadstead, is the principal port of entry for the State of Yucatan and the outlet for sisal, the most important export commodity of the region.

(*Bulletin of the Pan American Union*, June 1939)

NETHERLANDS

The Dutch Army is on a militia basis as in Switzerland. There is a secondary line of defense, or landsturm, in which service is voluntary. The Home Army consists of 1,568 officers and 15,769 other ranks. The Dutch industrialists are encouraging their employees to get trained for manning the antiaircraft batteries and attend to civilian defense generally. By 1941 Holland should have a modern naval force of 3 cruisers, 2 flotilla-leaders, 12 destroyers, 24 submarines, and 20 Scott-Payne motor torpedo boats for coastal defense. The Air Force has 600 machines, including eight belonging to the navy and 117 to the Colonial Army.

(*United Services Review*, May 18, 1939)

The Dutch infantry regiment includes within its basic organization, 3 artillery platoons, each platoon being armed with three 47-mm guns. Characteristic of this gun is its carriage which has a small wheel, enabling the gun to be motor or horse-drawn, as well as moved by hand.

The tube of this gun is 1,850 mm. long (with carriage 3,210 mm.), height 600 mm., weight with shield 240 pounds, traverse 60 degrees. The gun is supplied with a hydraulic compressor.

It fires two kinds of shells: (1) An armor-piercing shell weighing about three pounds, initial velocity of shell 2,170 feet per second; at a distance of 50 yards the shell pierces armor 30 mm. in thickness, at this distance the dispersion of 50 per cent of shells does not exceed 26 cm. in height and 29 cm. in width; (2) An explosive shell weighing over 5 pounds; initial velocity is 1,100 feet per second.

Each gun has a caisson estimated to hold 80 armor-piercing and 20 explosive shells.

(*Krasnaya Zvyezda*, 23 April 1939)

NORWAY

Orders for two destroyers have just been placed with the Horten Shipyard. The contract speed is 34 knots at 1,300 ton displacement.

(*Le Yatch*, 6 May 1939)

PANAMA

A census of the Canal Zone population is taken each year. The population in 1938 was 44,868.

The Republic of Panama takes a census every ten years, the last enumeration having been made in 1930. In Panama City, from 1920 to 1930, the population increased from 59,458 to 74,402. It is estimated that the present population of the city is 90,000. The population of the city of Colón is 35,000.

(*Report of the Health Department, Panama Canal*, 1938)

PERU

The highest highway in the world from Lima to Pucalpa starts at sea level and for five hours, the motorist travels steadily up through ever-growing imposing scenery until the crossing of the Andes at a point practically three miles high—1,600 feet higher than the top of Pike's Peak. From Pucalpa, on the lower Ucayali River, boats can go down the Ucayali and Marañon to Iquitos, the port for ocean-going vessels, 2,300 miles from the mouth of the Amazon.

(*Bulletin of the Pan American Union*, June 1939)

POLAND

The peacetime strength of the Polish Army is about 300,000 officers and men. It is composed of 10 corps, consisting of 30 infantry divisions, 1 cavalry division, and 12 separate cavalry brigades.

The territorial distribution of the Polish forces is as follows:

I Corps in Warsaw (8th, 18th and 28th Infantry Divisions, and 1st Cavalry Division);

II Corps in Lublin (3d, 13th and 27th Infantry Divisions and one cavalry brigade);
III Corps in Grodno (1st, 19th and 29th Infantry Divisions and three cavalry brigades);
IV Corps in Lodz (7th, 10th and 26th Infantry Divisions);
V Corps in Krakow (6th, 21st and 23d Infantry Divisions and one cavalry brigade);
VI Corps in Lwow (5th, 11th and 12th Infantry Divisions and two cavalry brigades);
VII Corps in Poznan (14th, 17th and 25th Infantry Divisions and one cavalry brigade);
VIII Corps in Torun (4th, 15th and 16th Infantry Divisions and one cavalry brigade);
IX Corps in Brzesc-on-the-Bug (9th, 20th and 30th Infantry Divisions and one cavalry brigade);
X Corps in Przemysl (2nd, 22nd and 24th Infantry Divisions and one cavalry brigade).

The Polish infantry division consists of 3 infantry regiments and one regiment of light artillery. The cavalry division includes 3 brigades of 2 cavalry regiments each, and 2 battalions of horse artillery. The separate cavalry brigade consists of 2 or 4 cavalry regiments and one battalion of horse artillery.

Included in the Polish armed forces are also troops of the border patrol.

Thus, in peacetime, the Polish Army consists of 323 infantry battalions, 272 cavalry squadrons, 481 artillery batteries, the latter consisting of 303 light artillery, 90 heavy, 9 super heavy, 39 horse and 40 antiaircraft batteries.

Tank units include 12 tank battalions and 4 battalions of combat vehicles.

The Engineering forces include 28 battalions consisting of 14 pioneer, 1 chemical and 13 signal battalions.

The air force consists of 6 aviation regiments and 1 aviation battalion, altogether about 1,500 planes, and 2 balloon battalions.

The infantry and cavalry have arms (rifles, heavy and light machine guns) of unified caliber (7.9 mm) and of good technical and ballistic qualities. The Mauser rifle is the 1925 model. Light and heavy machine guns of the Colt-Browning model, are of Polish manufacture, as are the 46-mm and 81-mm Stokes-Brandt mortars and the 37-mm Bofors antitank gun.

The basic armament of the infantry regiment includes 108 light and 36 heavy machine guns, 27 light mortars and 9 Stokes-Brandt mortars, 9 antitank guns and four 75-mm field guns. A regiment of light artillery consists of 2 howitzer battalions and one field gun battalion. Each artillery battalion includes three 4-gun batteries. In addition to this each artillery regiment has 18 heavy machine guns (2 to each battery).

(*Krasnaya Zvyezda*, 23 April 1939)

The new Polish constructed army plane—LUP—nominally a two-seater pursuit ship, is most versatile. This ship can be used for pursuit missions at high altitudes and close to the ground. It can be a power-diving bomber with a 600-lb. load of explosives. Because of its strong armaments and fuel reserve estimated for flights of 750 miles, this ship can also be used for convoy purpose for groups of bombing planes.

This plane is armed with one cannon and two machine guns in the forward part of the ship, and two double machine guns in the observer's cabin.

The ship's dimensions are: wing spread—33 feet; length—27 feet. It has two "FOKA" motors totalling 900 H.P. The ship weighs 3,700 pounds when empty and 6,100 pounds with armaments. Maximum speed at 13,000 feet altitude is 280 miles per hour, cruising speed close to ground 240 miles per hour. Ceiling—32,000 feet.

(*Krasnaya Zvyezda*, 14 April 1939)

A new system has been announced by the War Ministry concerning service in the Polish Cavalry.

Beginning with the present year, candidates called to the colors will serve four years, the time of service to be distributed as follows:

First year: 3 November—20 December; 7 January—18 March, 4 months; 15 May—15 June, 1 month; middle of August to middle of September (maneuvers), 1 month; Total six months.

Second year: 18 January—18 March, 1 month; 15 May—15 June, 1 month; middle of August to middle of September (maneuvers), 1 month; Total, 4 months.

Third year: 1 October—31 October, 1 month.

Fourth year: From the middle of August to the middle of September (maneuvers), 1 month.

(*Polska Zbrojna*, official organ of the Polish War Ministry)

PORTUGAL

In addition to its commitments to France and Belgium, Great Britain has had an alliance with Portugal, in one form or another, since 1373, and the treaty of 1810, in which the two countries agreed that "there shall be perpetual, firm and unalterable friendship, defensive alliance, and strict inviolable union," between them, was reaffirmed by Premier Salazar before an extraordinary session of the Portuguese National Assembly on 22 May 1939. On 17 March, however, Portugal concluded a non-aggression pact with Spain, in which each undertook not to let third powers use its territory for an attack on the other—a pledge which might prevent Great Britain from using Portuguese territory for the passage of British troops operating against Spain.

(*Foreign Policy Reports*, 15 July 1939)

RUMANIA

The personnel of the Rumanian Navy consists of 250 officers and 3,000 men. The naval budget for the fiscal year 1939 carries an increase of 17 per cent.

(*Marine-Rundschau*, April 1939)

RUSSIA

Motorization and Mechanization:

Russia is pushing on fast with a radical program of motorization and mechanization of her army, and in the

1937 maneuvers all transport was motorized; a company of amphibious tanks formed part of each infantry regiment and a battalion part of each division. The present projects include the formation of small *combat teams* of infantry, tanks and artillery in units as far down as regiments and battalions. The Russian moto-mechanized brigade has 27 medium tanks, 228 light tanks, 10 sections of motorized artillery and a two-battery group of field artillery, and has combat cars and motorcycles for distant reconnaissance purposes.

(*Bulletin Belge des Sciences Militaires*)

The Soviet Parliament approved an appropriation of 40,885,000,000 rubles (about $8,177,000,000) for the Red Army and Navy for the fiscal year 1939. The new budget for defense represents an increase of nearly $3,500,000,000 over the amount appropriated in 1938.

(*Krasnaya Zvyezda*, 30 May 1939)

Official figures for the Soviet census taken on an entire territory of the U.S.S.R. on 17 January 1939, show the population of the Soviet Union to be 170,467,186. Since the last census, in 1926, the Soviet population has grown by 23,000,000. An interesting information revealed by the figures of the last census, is the great increase in the Soviet urban population as result of industrial activity. Many important Soviet cities have grown in population from 150 per cent to 300 per cent, and entirely new cities, heretofore unknown to map makers, have sprung up.

(*Krasnaya Zvyezda*, 2 June 1939)

An order issued by Marshal Voroshilov on 9 May 1939 reduces the term of instruction in military schools by six months. This measure is motivated by the present strained political situation in Europe, which necessitates immediate preparedness of the Red Army for war. It is expected that about 5,000 new officers will be commissioned in six months.

(*Hufvudstadsbladet*, Finland)

According to official Soviet dispatches—the first of their kind ever published by the Red Army command—a total of 3,002 war planes participated in the May Day celebration throughout the Soviet Union, last May 1st.

Close analysis of the published figures reveals, that the greatest individual displays of Soviet air power took place in Moscow and Leningrad, with 603 and 300 planes respectively, participating in the parades of these cities. In the several strategic Siberian centers, 870 war planes flew as a part of the May Day celebration, while 700 ships took part in the festivities in several of the important cities in western U.S.S.R., and 279 planes in the Caucasus. The balance was distributed through various other localities of the Soviet Union.

(*Krasnaya Zvyezda*, 4 May 1939)

Numerous articles in the Russian press suggest that the Soviet Air Force units are at the moment concentrating on service training at approximately the full operational ceiling. References have been made to formation flights of fast bombers at 25,000 feet, and air firing against sleeve targets at heights above 30,000 feet. Practice air fighting at the same height is also reported.

(*Royal Air Force Quarterly*, April 1939)

According to latest available reports the Soviet Navy consists of the following:

Under-age ships in service:

Capital ships	4
Cruisers	3
Destroyers and torpedo boats	6
Submarines	110
Escort vessels	2
Minor craft	6

Over-age vessels in service:

Cruisers	2
Minelayers	1
Destroyers and torpedo boats	11
Submarines	12
Minor craft	7

(*United Services Review*, June 1, 1939)

SALVADOR

The Constituent Assembly of El Salvador which met on 20 November 1938, to draft a Constitution to replace that of 1866, approved the text of the new document on 20 January 1939, and President Martinez promulgated it the same day.

(*Bulletin of the Pan American Union*, June 1939)

SPAIN

According to Nationalist reports, Government Spain's losses of airplanes in 1937 and 1938 were as follows:

Type	*1937*	*1938*	*Total*
Martin Bomber (American Model, constructed in Russia)	12	80	92
Natascia (Russian Model)	1	28	29
Ratas (Russian construction of the American Boeing)	7	111	118
Mosca (Curtis Model, built in Russia)	41	308	349
Sovoia (hydroplane)	11	--	11
Potez (French)	20	--	20
Nickers (British)	10	--	10
Devoitine (French)	13	--	13
Dornier (hydroplane)	5	1	6
Breguet (French)	25	--	25
Nieuport (French)	33	--	33
Praga (Czech)	--	4	4
Miscellaneous	180	133	313

The French types and the Italian Savoia were in hands of the Spanish Army before the Revolution.

According to the above report a total of 1,023 Government planes were shot down: 358 in 1937 and 665 in 1938.

(*Deutsche Wehr*, No. 52, 1939)

SWITZERLAND

It is reported that towards the end of 1938 a syndicate was registered at Zurich under the style of "Société d'Etudes pour La Création d'une Fabrique d'Avions S.A., Zurich-Oerlikon," with a capital of 100,000 francs, to investigate the possibility of establishing a Swiss aircraft factory with a share capital of 5,000,000 francs. The management has been authorized to proceed with the acquisition of a factory site in the neighborhood of Lake Lucerne.

(*Royal Air Force Quarterly*, April 1939)

The Swiss Army which formerly consisted of 3 army corps comprising 6 infantry divisions, Gothard special troops and 3 cavalry brigades, has been recently completely reorganized.

It still has 3 army corps, but the number of divisions has been increased to 9 (8 field and 1 Gothard). These divisions each have 3 infantry regiments (except 2 that have 4) and 1 field artillery regiment of 9 batteries and 2 motorized battalions of 105-mm. Two of these divisions have, in addition, 2 mountain batteries. They also have a reconnaissance group, 1 squadron and 1 cyclist company for liaison, a motorized company of infantry cannons, a battalion of sappers and a telegraph company.

The 9th Division — Gothard — is particularly well equipped with matériel.

Besides the three army corps, there are 3 mountain brigades which are in fact, small divisions, especially armed and equipped to suit the terrain conditions where they are expected to be employed.

(*La France Militaire*, May 29, 1939)

The 1939 budget for the military air service in which is included the "Defense contre-aerienne," amounts to 702,491 pounds, an increase of 262,169 pounds over 1938. In addition, 19,924 pounds are devoted to passive air defense.

(*Journal of the Royal United Service Institution*, May 1939)

TURKEY

Turkey, unlike other countries, does not have a Commander-in-Chief in her navy. The various branches of the navy are concentrated in the General Staff. The Chief of the General Staff is, in a sense, Commander-in-Chief.

(*Naval Institute Proceedings*, July 1939)

VENEZUELA

Employees and laborers of petroleum companies and all other commercial and industrial establishments in Venezuela received their first bonus last March under the profit-sharing law signed by President Contreras on 17 December 1938.

The employee receives only half of his bonus in cash. The other half is deposited to his account in the savings department of a local bank. This constitutes a form of compulsory saving, since prior to the deposit of six annual bonuses the employee may not withdraw his funds except in case of extreme emergency, and then requires the approval of a labor official.

(*Bulletin of the Pan American Union*, June 1939)

LESSONS OF THE SPANISH CIVIL WAR

1. As soon as two belligerents are of equal strength there is every prospect of static warfare setting in. This static warfare is no transitory symptom of 1914-1918.

2. Infantry remains the main combatant arm. Air and armored units must do all they can to support their infantry.

3. Strong artillery fire remains of the highest importance. To its former tasks must be added the defeat of armored units.

4. The antitank arm has shown itself to be the equal of any tank attack.

5. Armored attacks require the support of other arms.

6. Low-flying aircraft are of the utmost importance.

7. A good road system favors mechanical transport, which also demands a most careful organization.

(*Militär Wochenblatt No. 37*, 10 March, 1939)

AERIAL RECONNAISSANCE
AUGUST 10, 1861

(Copy)

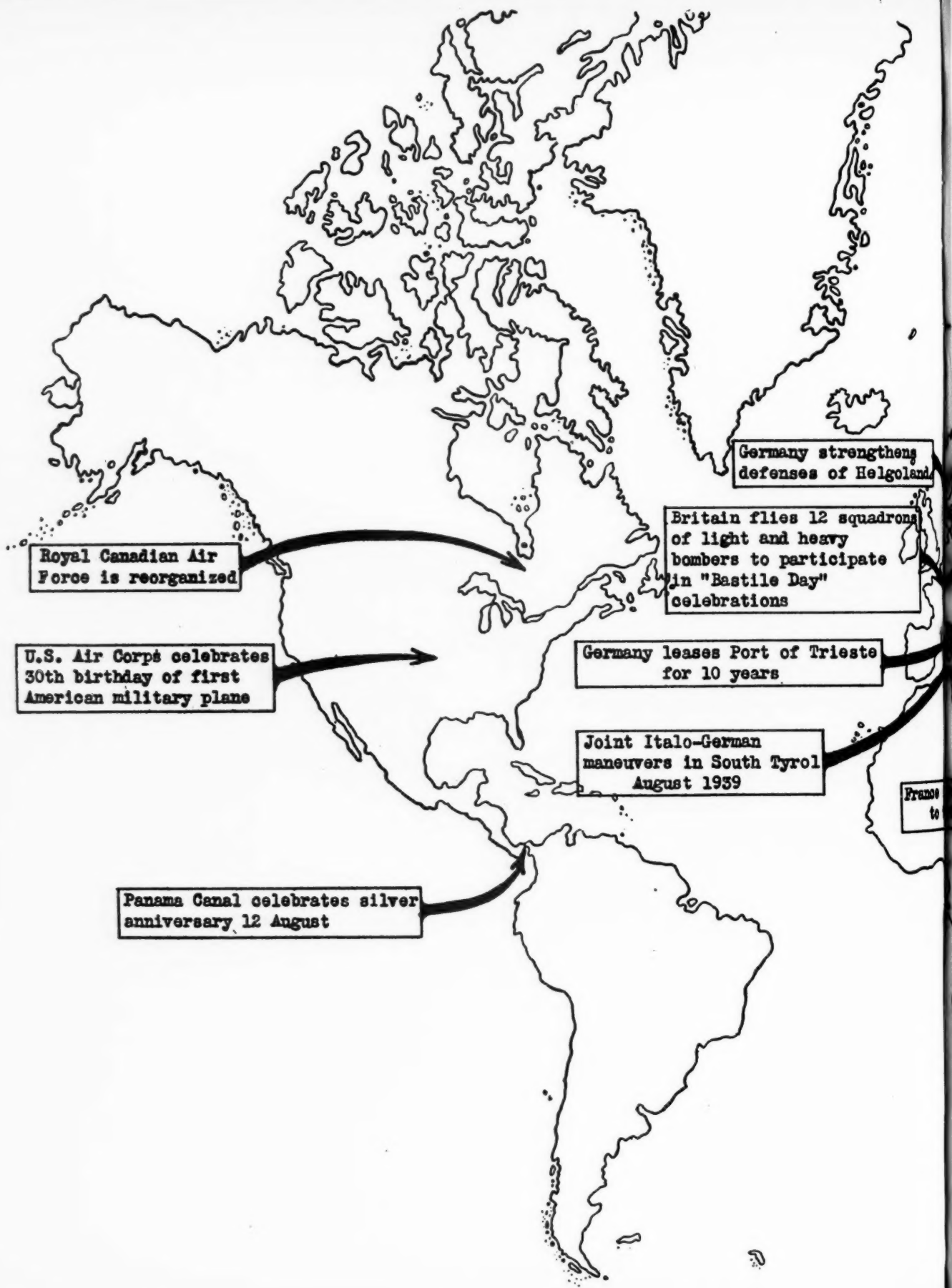
Camp 11 1861.

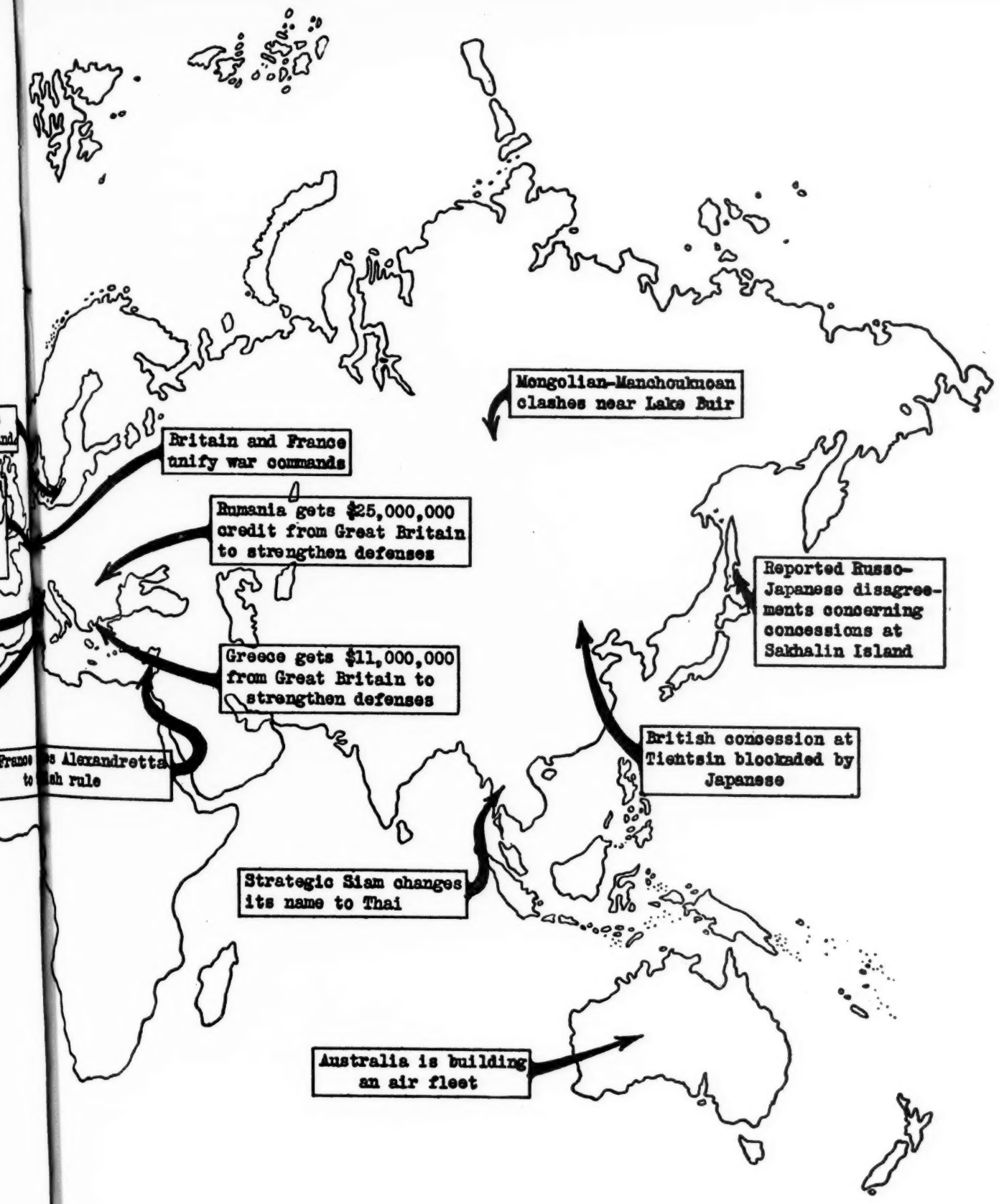
Brig Gen
Irvin McDowell
Sir.

I have the honor to report that on the 10th of Aug I made the ascension in which I attained an altitude of 3,311 feet and made observations as follows. about six or seven miles South West from Hampton I discovered an encampment of the enemy, but owing to the misty state of the atmosphere caused by the recent rain I was unable to form a correct idea of their numerical force. but should judge from four to five thousand. there were no tents or encampment of any kind either at York or Back Rivers or at Newmarket Bridge. On a branch of James River about 8 miles from Newport News on the opposite side there is a encampment of about the size of that of James River about eight or nine miles from Newport News it is a large encampment of the enemy from 10 to 20 tents. also an encampment at the mouth of the Big Bethel Batteries of from 40. to 50 tents. At Hampton two large ships of War are lying at anchor in the stream one of which appeared all ready for sea with sails set &c. For observations at Yorktown Creek. I refer to the accompanying sketch which I drew from observation. From it the only heavy guns of the enemy's Batteries or encampments were visible.

With respect
(Signed) John La. Mountain
Aeronaut

Aerial reconnaissance was first used by the United States Army in 1861. The above is a reproduction of one of the earliest aerial reconnaissance reports. The original is in the Old Records Section of the A.G.O.


Germany strengthens defenses of Helgoland
Britain flies 12 squadrons of light and heavy bombers to participate in "Bastile Day" celebrations
Royal Canadian Air Force is reorganized
U.S. Air Corps celebrates 30th birthday of first American military plane
Germany leases Port of Trieste for 10 years
Joint Italo-German maneuvers in South Tyrol August 1939
Panama Canal celebrates silver anniversary 12 August


Mongolian-Manchoukuoan clashes near Lake Buir
Britain and France unify war commands
Rumania gets $25,000,000 credit from Great Britain to strengthen defenses
Reported Russo-Japanese disagreements concerning concessions at Sakhalin Island
Greece gets $11,000,000 from Great Britain to strengthen defenses
British concession at Tientsin blockaded by Japanese
Strategic Siam changes its name to Thai
Australia is building an air fleet

The Spanish Civil War

The general organization of the victorious Insurgent Forces at the end of the war, as given by the Nationalist publication "Spain," was as follows:

Commander-in-Chief of Land, Sea and Air Forces: Generalissimo Francisco Franco Vahamonde.

General Staff of the Commander-in-Chief:

General Francisco Martin Moreno, Chief of Staff
General Juan Vigon, Attaché of the Commander in Chief
Colonel Luis Gonzalo, Deputy Chief of Staff
Lieutenant Colonel Antonio Barroso

Chiefs of Sections of the General Staff:

General Joaquin Garcia Pallasar, Chief of Artillery
General Salvador Garcia de Pruneda, Chief of Engineers
General Melchor Camon, Chief of the Sanitary Service
General Miguel Gallego, Adjutant General
Colonel Joaquin Lahuerta, Chief of Motor Transport
Colonel Eduardo Hernandez Vidal

LAND FORCES

Army of the East: General Luis Orgaz Yoldi, Commanding

Army Corps of Galicia: General Antonio Aranda, Commanding

55th Division, Colonel Adrados
83rd Division, General Martin Alonso
58th Division, Colonel Garcia Navarro
108th Division, Colonel Amado

Army Corps of Castille: General José E. Varela, Commanding

3d Division, General Iruretagoyena
15th Division, General Garcia Escamez
57th Division Colonel Izquierdo
81st Division, Colonel Ollo Alvarez
85th Division, Colonel Cuervo
152nd Division, General Rada

Groupment of the Divisions of Albarracin: General La Torre, Commanding

52nd Division, Colonel Cremades
56th Division, General La Torre

Army Corps of Aragon, General José Moscardo Ituarte, Commanding

51st Division, General Urrutia
53rd Division, General Sueiro
54th Division, General Marzo

Groupment of the Divisions of Guadalajara: General Perales, Commanding

73rd Division, General Abriat
75th Division, General Los Arcos

Army Corps of Urgel: General Agustin Muñoz Grande, Commanding

61st Division, Colonel Rodrigo
62nd Division, General Sagardia
150th Division, Colonel Siro Alonso

Army of the Center: General Andrés Saliquet Zumeta, Commanding

First Corps: General Espinosa de los Monteros, Commanding

16th Division, Colonel Losas
18th Division, Colonel Rios Capape
20th Division, Colonel Caso

Army Corps of Maestrazgo: General Rafael Garcia Valiño, Commanding

82nd Division, Colonel Delgado Serrano
84th Division, Colonel Galera
1st Division, Colonel Mohamed Ben Mizzian

Army Corps of Navarre: General José Solchaga Zala, Commanding

4th Division, General Alonso Vega
5th Division, General Sanchez Gonzalez
63rd Division, General Rolando Tella

Army Corps of the Legion: General Gaston Gambara, Commanding

"Littorio" Division, General Bitossi
"Black Arrows" Division, Colonel Babini
"Blue Arrows" Division, Colonel La Perla
"Green Arrows" Division, Colonel Batisti

Army Corps of Toledo: General Ponte, Commanding

14th Division, General Carroquino
11th Division, General Bartomeu
71st Division, General Palenzuela
74th Division, Colonel Arias

Groupment of Divisions of Somosierra: General Serrador, Commanding

72nd Division, Colonel Valverde

Groupment of Divisions of the Tagus: General Salvador Mugica, Commanding

107th Division, Colonel Santa Pau
19th Division, Colonel Puenta
17th Division, Colonel Pimentel

First Cavalry Division: General José Monasterio, Commanding

Army of the South: General Gonzalo Queipo de Llano, Commanding

Army Corps of Extremadura: General Luis Solana, Commanding

21st Division, Colonel Oliver
24th Division, Colonel Rodriguez de la Herranz
60th Division, Colonel Jimenez

Army of Granada: General Gonzalez Espinosa, Commanding
- 32nd Division, Colonel Tamayo
- 33rd Division, Colonel Rosaleny
- 34th Division, Colonel Acosta

Army Corps of Córdoba: General Borbon (Duke of Sevilla) Commanding
- 22nd Division, Colonel Erquicia
- 23rd Division, Colonel Martinez Campos
- 31st Division, General Martin Prats.

Army Corps of Morocco: General Juan Yagüe, Commanding
- 12th Division, General Asensio
- 13th Division, General Barron
- 105th Division, Colonel Lopez Bravo

Army Corps of Andalusia: General Muñoz Castellanos, Commanding
- 40th Division, Colonel Gonzalez Badia
- 102nd Division, Colonel Castejón
- 112th Division, Colonel Baturone
- 122nd Division, Colonel Redondo

Second Division of Cavalry: General Gete, Commanding

NAVAL FORCES

Admiral Juan Cervera Valderrama, Naval Chief of Staff

Rear Admiral Salvador Moreno Fernandez, Deputy Chief of Naval Staff

Vice-Admiral José Maria Gomez Fossi, Commander, Department of El Ferrol

Vice-Admiral Francisco Bastarreche Diaz Bulnes, Commander, Department of Cadiz

Rear Admiral Ramon Agacino Armas, Chief of the Forces on the East Coast

Vice-Admiral Manuel Moreu Figueroa, Commander, Base and Balaeric Squadron

Cruiser Division: Vice-Admiral Manuel Moreu, Commanding

Destroyer Flotilla: Naval Captain Arturo Genova

AIR FORCE

General Alfredo Kindelan, Chief of the Army of the Air

Colonel Luis Moreno Abella, Chief of Staff of Air

First Brigade: Colonel Gallarza, Commanding
- 1st Squadron, Lieutenant Colonel Gallarza
- 2nd Squadron, Lieutenant Colonel Rubio
- 3rd Squadron, Lieutenant Colonel Manzaneque
- Pursuit Squadron: Major García Morato

Second Brigade: Colonel Orleans, Commanding
- 1st Squadron, Lieutenant Colonel Arranz
- 2nd Squadron, Lieutenant Colonel Frutos
- 3rd Squadron, Lieutenant Colonel Palacios

Third Brigade: Colonel Saenz de Buruaga, Commanding
- 1st Squadron, Lieutenant Colonel Ansaldo
- (This Brigade also comprised four independent groups)

The Italian aviators who had volunteered either as civilians or as members of the Royal Italian Air Force (Regia Aeronautica) to fight for the Insurgents in Spain, returned to Italy 15 June 1939. About 2,800 of them landed in Genoa.

"La Vie dell'Aria" published on 10 June 1939 a table of the units which had been sent to Spain and had now returned. The figures published officially in the above named publication, are of historical value as showing the actual help given to General Franco's forces by Italian aviators and air personnel.

The Roman numerals given for the units, whether "Stormo, Gruppo or Squadriglia," seems to be those of regular units of the "Regia Aeronautica," but it is believed that the personnel were volunteers from the regular units who were allowed leave to go to Spain. The aircraft were bought by Spain.

The following figures as published by the "Aeroplane," June 28, 1939, will be found of interest:

Military personnel, who participated in the campaign, 5,699. Civil personnel, 312. Total,—6,011.

Flying Activities:—Flights made, 86,420. Hours flown, 135,265. Explosives dropped, 11,584,420 Kgs. Cartridges, fired, 1,042,712.

Combats, 266. Bombardments, 5,318. Reconnaissances, 2,170. Ground attacks, 155.

Enemy ships sunk by air attack, 224. Enemy airplanes shot down, 903. Enemy airplanes destroyed on the ground, 40. Legionary airplanes shot down, 86.

Personnel killed during the War, 175. Personnel wounded, 192.

NAMES OF THE LEGIONARY UNITS:—

21st Stormo Heavy Bombers (S.81) XXIV Gruppo "Pipistrelli," XXV Gruppo "Pipistrelli."

111th Stormo High-speed Bombers (S.79) XXIX Gruppo "Sparvieri," XXX Gruppo "Sparvieri."

35th Gruppo (autonomous) B.V. (Br.20) "Cicogne."

3rd Stormo of Pursuit (Cr. 32) VI Gruppo "Gamba di Ferro," XVI Gruppo "La Cucaracha," XXIII Gruppo "Asso di Bastoni."

Squadriglia (autonomous) of multi-gun pursuit machines (Cr.32) "Frecce."

Squadriglia of ground attack (Br.63) "Il Baffo."

Gruppo of experimental pursuit machines (G.50).

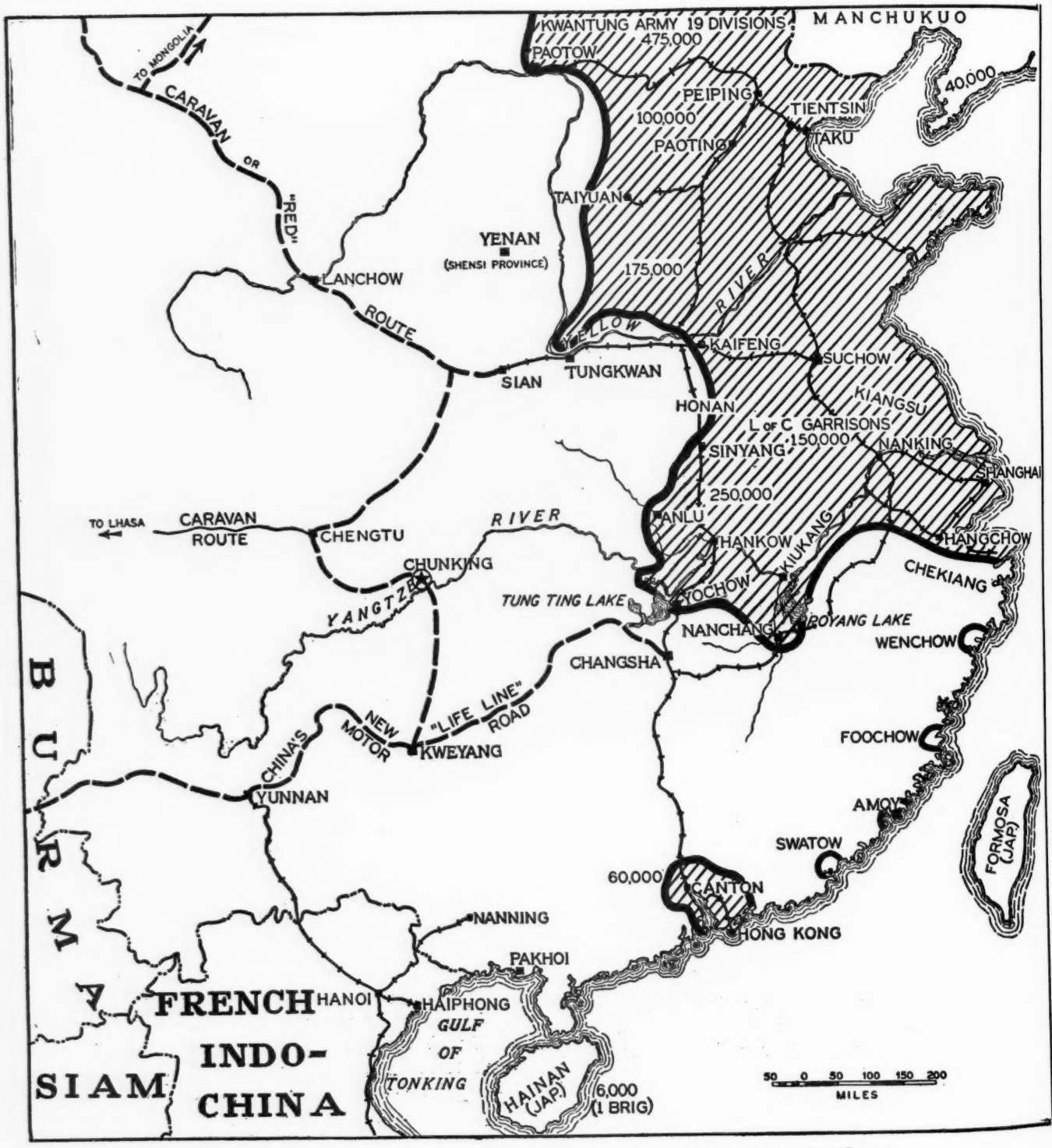
22nd Gruppo air reconnaissance (R.37) "Linci."

IN THE BALEARES:—25th Gruppo Night Bombers (S.81) "Pipistrelli delle Baleari."

8th Stormo High-speed Bombers (S.79) XXVII Gruppo "Falchi delle Baleari," XXVIII Gruppo "Falchi delle Baleari."

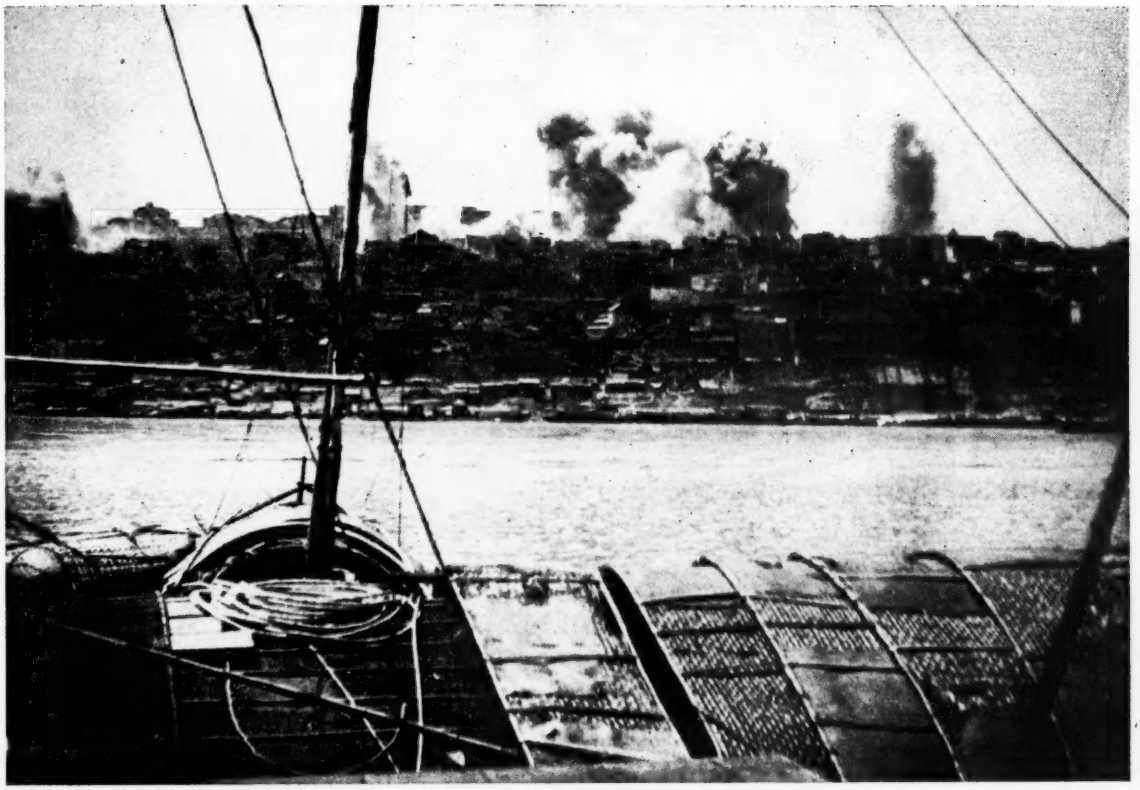
10th Gruppo (autonomous) pursuit machines (Cr.32).

The Sino-Japanese War



Situation As of 1 August 1939, Showing Number of Japanese Troops Engaged in China.

The Sino-Japanese War



Wide World Photo.

JAPANESE PLANES BOMB CHINA'S CAPITAL

No important operations have been undertaken since the capture of Nanchang last March. All military efforts have been overshadowed by the British-Japanese crisis, which threatens the whole status of the Occidentals in the Far East.

On 14 June, Japanese troops began an armed blockade of the British and French concessions isolating more than 100,000 persons—of which several thousand are Occidentals —from Tientsin proper and the outer world. The blockade was aimed at the British concession, but Japan found it necessary to extend the blockade order to include the French concession, despite the absence of any French-Japanese dispute, because only in such a manner could a blockade of the British settlement be made effective.

The British-Japanese negotiations are a matter of the utmost concern to every nation with business interests in China and the results of these conferences will have far reaching effects.

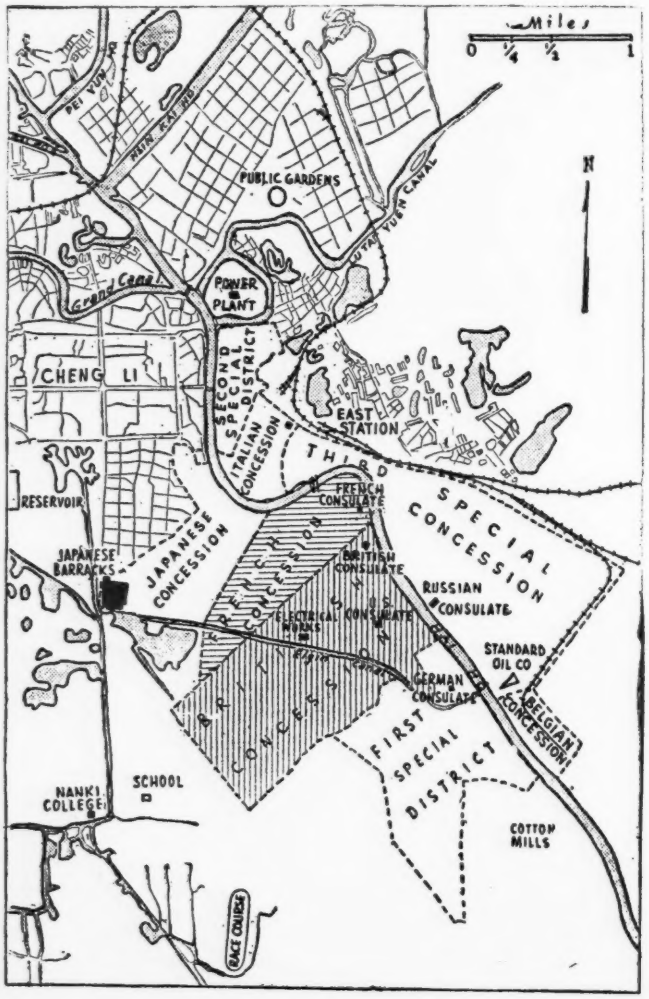
The Japanese, intent on establishing a "new order in Eastern Asia" through conquest, find that the special position occupied by the Occidentals for approximately a century constitutes one of their chief obstacles to domination of China.

A quarter of a century ago, there were 29 foreign concessions and two international settlements in China, but since then the number has decreased. The International Settlements at Shanghai and at Kulangsu (Amoy) remain, but there are only nine concessions left in China today and of these there are only three of any real significance, namely, the British and French concessions at Tientsin and the French concession in Shanghai. Together with the Shanghai International Settlement they constitute the last place of refuge for British and French interests in China.

Foreign concessions in Tientsin date from 1860. Once there were eight of them, but the German, Austrian and Russian areas reverted to the Chinese after the World War and the Belgian area disappeared in 1928. There are at present foreign concessions in five Chinese cities: Shanghai, Tientsin, Hankow and Canton. In all but the last, there has been trouble since Japan began her invasion of China, 7 July 1937.

These foreign areas are a thorn in the flesh of the Japanese. Wherever the Japanese have established themselves in China, they have attempted to create a commercial and economic monopoly for their nationals. They have done so in Manchukuo, have been steadily trying to do so in North

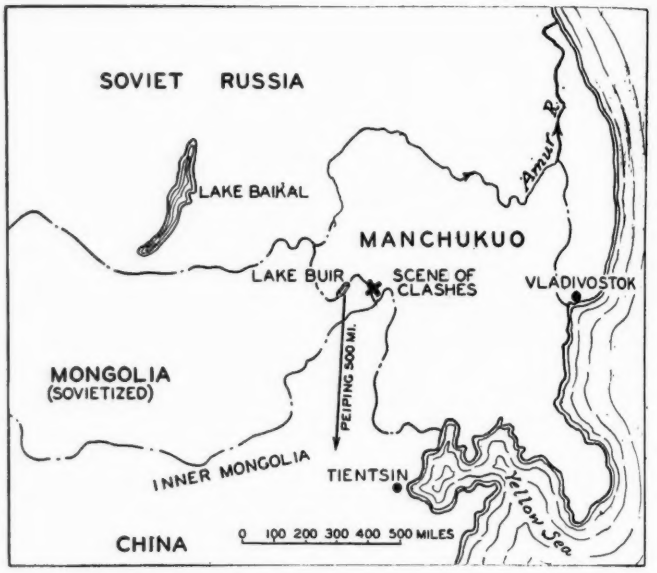
China, and with equal persistence but with less success in Shanghai. The Japanese claim that these concessions are "hot beds" of anti-Japanese agitation, while the Occidentals charge that Japan wants to bring these foreign areas under her control so as to eliminate foreign competition for her trade in China.



FOREIGN SETTLEMENTS IN TIENTSIN

Japan's increasingly bold attack on foreign settlements has brought to a climax her drive on Western interests during the past eight months involving occupation of Canton and seizure of Hainan and Spratly Islands. According to observers, these moves have tended to transform Japan's struggle against China into a struggle against the Western Powers. The real issue at Tientsin is not the trivial incident involving four Chinese terrorists, but a duel between the East and the West for China's vast treasure.

The area of conflict in the Far East has been further enlarged by heavy fighting on the Manchukuo—Outer Mongolia frontier near Lake Buir Nor. A series of battles between Soviet-Mongolian and Japanese-Manchukuoan forces featuring airplane engagements apparently has been taking place in this region since 11 May. Outer Mongolia, or the Mongolian People's Republic, was founded 10 July 1924 or a little over fifteen years ago. It has a well organized and well trained army, equipped and assisted by Soviet troops. It is doubtful that these numerous clashes will lead to a conflict on a large scale. Russia at this time seems unwilling to become involved in a war in the Far East, while Japan may not want to fight Russia at a time not of her choosing, while still struggling in the morass of China.



SCENE OF FIGHTING ON THE MANCHUKUO-MONGOLIAN FRONTIER

Two years ago last 7 July, Chinese troops near the Marco Polo Bridge over the Yungting River, southwest of Peiping, fired on Japanese forces engaged in night maneuvers. The Japanese retaliated and the war, never formally declared, was on. At that time, the Japanese Army and nation believed that the war would be short. Soldiers spoke of six months, even four months. By December 1937, the main Chinese armies had been defeated and Nanking—the capital—captured. Since that date, the war has been a test of endurance.

The petty clash at Marco Polo Bridge has been converted into the biggest war of modern times. There have not been classic battles like Waterloo, the Marne or Tannenberg, but in the obscure fields of China more than a million men have died and over a million and a half have been wounded.

Japan has won many victories, the area of China said to be occupied by the Japanese covers over 600,000 square miles, about two and a half times the size of the Japanese Empire. However, victory has not come and in the third year of the war the Japanese nation is being organized for a prolonged conflict.

Japan is making a strong drive to break down foreign support of China and now that she has nothing to gain from a continuance of war and there are no further military operations that can change the situation, there appears to be a growing desire for peace.

The Chinese, lacking heavy armaments and aircraft have concentrated on guerrilla "hit-and-run" tactics. The opinion among foreign military observers regarding guerrilla tactics is divided, some believing that, while they are annoying, they cannot possibly be a deciding factor in the war; others declare that Chinese chances of victory lie solely in the continuance of these guerrilla tactics over a

long time, thereby causing an increasing drain on Japanese manpower as well as a disheartenment among the rank and file of the Japanese Army. Be it as it may, it is an indisputed fact that Japan has over one million men engaged in China and that the present military venture is costing Japan millions of yen daily with no appreciable returns.

At the end of two years of war, Japan finds it increasingly difficult to go forward, but she cannot retreat. The extent to which Japan has achieved her military, political and economic objectives, overwhelming as they appear to be, cannot be found in the succession of Japanese military victories, but rather in the degree to which these victories have contributed to a definite outcome of the war.

The effective exploitation of the conquered area is looked upon by Japan not only as a legitimate fruit of victory but as a necessity if she is to win the war. As things stand now, the outcome of that struggle is likely to depend on whether Chinese resources and Chinese stamina can outlast Japan's capacity to finance a war. The former depends, in part, on the amount of aid which China can get from the outside world; the latter on the amount of raw materials which Japan can get out of China without having to pay for them in foreign exchange. By supporting the Chinese exchange and refusing to turn to the Japanese the Chinese silver reserves kept by the Chinese banks out of Japanese reach, the British and French authorities have prevented Japan from driving out Chinese currency in the Tientsin—Peiping area. If Japan achieves this purpose, it will then be possible for the Japanese to buy Chinese products without paying for them at the actual rate of exchange.

In order to win, without outside military aid, either China must reorganize her armies and launch a strong and skillful counteroffensive against a well prepared enemy, or Japan must collapse at home. For Japan to win, she must crush all military resistance, restore order and succeed in getting cooperation from the Chinese themselves. These possibilities are so remote at present that it would be rash indeed to attempt to make any prophecies as to when or how this conflict will end.

Wide World Photo.

JAPANESE PLANES IN READINESS FOR ACTION IN CHINA

Foreign Military Digests

Digests of important articles from foreign military periodicals; the remaining articles for each magazine are listed in Catalog of Selected Periodical Articles.

THE ATTACK PLANE

[Condensed from an article by Colonel A. Osipenko in *Krasnaya Zvyezda* (Russia), September 28, 1938. Translation by Historical Section, Army War College, Washington, D.C.]

By Lieutenant Colonel E. M. Benitez, *Coast Artillery Corps*

"Chain" Attack

"Passing" Attack

Two Methods of Attack Against Ground Troops Used by Italian Aviators in Spain
(From Bulletin Belge des Sciences Militaires, June 1939)

The old Air Service regulations used to contain something along the following lines with regard to attack aviation: "The object of the attack plane is to attack ground troops, using machine guns and bombs for the purpose. The attack plane is a two-seater with a speed of 110 to 120 miles per hour, flying at low altitude."

The old conceptions of the attack plane are far from being true today.

The experience of the war in Spain has served to demonstrate the tremendous importance of attack aircraft. Under the most diverse conditions, at different stages of combat, the Government air forces accomplished remarkable results with their attack aviation (or pursuit craft used instead). Cooperating with the ground forces, this aviation insured the success of these forces. It will suffice, in this connection, to recall the action of the Republican forces at Guadalajara where, with the aid of attack aviation, they routed an entire Italian expeditionary corps, to comprehend the role and importance of the attack craft in modern combat.

And yet certain skeptics, even after such examples, still maintain that the question of attack aviation is one "open to discussion." We have some "statisticians" who tell us that attack craft employed on the battlefield will suffer 30 per cent losses. However, these statements can be refuted with little effort. Let us present a brief statement by Lieutenant Jonuero, member of a Government attack aviation squadron in Spain, whose squadron participated in forty-three raids. He says:

"Flying over various fronts, our squadron attacked the rebel troops under varying combat conditions, during their attacks and retreats. Our squadron made 43 raids against different targets and in spite of the fact that the rebel forces were well equipped with antiaircraft weapons, we only lost one plane. And we flew at low altitudes, from 900 to 15 feet."

An important argument brought to bear against attack aviation is that it must inevitably suffer heavy losses, since the attack craft must fly at low altitudes. It is a contention which may at first glance appear sound, and because of this, must be refuted. The assertion that the attack plane must always fly at a low altitude is erroneous; in fact, this is the very thing that, under modern warfare conditions, it must often avoid doing.

The modern attack plane must be a swift, power-diving plane. This will insure its success in battle. Power-diving planes have won for themselves an important place in the best armies. In America, nearly all types of planes, up to and including the medium bomber, are first subjected to power-diving tests. It is an established technical requirement of the plane.

The Government attack aviation in Spain undertook flights, in accordance with the particular requirements of the situation, at altitudes of anywhere from 16,000 to 9,000 feet down to 15 feet. As may be readily noted, these altitudes were far from holding the attack plane to any specially defined altitude limits. Where the nature of the terrain and the situation permitted, hedge-hopping was undertaken. Otherwise the attack planes power-dived on the enemy from an average altitude of 9,000 to 16,000 feet. Swooping down from such an altitude with complete surprise on the enemy on the ground, the attack craft produced an overwhelming effect and inflicted tremendous losses.

The attack plane must have great speed because of the increased speed of the other types of planes. This will afford it the same advantages enjoyed by the swift bomber, for example. Of course, in spite of any qualities that the attack plane may possess, it is bound to be subjected to the enemy rifle and machine-gun fire during low-altitude flights, while hedge-hopping or power-diving. Against this, the flyer, along with the more vulnerable parts of the plane, may and should be protected by armor.

We have shown, in general, what the attack plane should be like. It should be a strong, durable machine, with powerful armament (always a requirement of the attack plane, and now more important than ever), great speed (in the neighborhood of 250 miles per hour), and good maneuverability. The pilot's cabin, seat and back, as well as the lower part of the motor should have armor protection.

Next let us take up the matter of attack plane performance. Suppose a situation developed something like this: A battle is raging. A very favorable moment has arrived for the utilization of the aviation against the enemy. However, the weather is very bad. There are low-hanging clouds. We could use bombardment craft if the clouds were a little higher or if there were any "pockets" in them through which the bombing could be effected. What is to be done? It is evident that in this situation, only attack aviation could be successfully employed. Its advantages over the bombardment craft is here apparent. Performing practically the same missions of the light bombardment craft, the attack aviation (or pursuit craft that may be utilized in its place) will, under the circumstances produce much better results than might be expected of the bombardment craft.

The above situation is not a mere product of the imagination. It is precisely what happened in Spain during the Teruel operations. The commander of the Government forces here, finding it impossible to employ his bombardment craft on account of low-hanging clouds (600 to 750 feet), decided on strafing action—utilizing pursuit craft for the purpose. On one occasion, for example, pursuit craft, covered by the particular terrain, came upon (among others) an Italian battalion situated in a defile, and destroyed it completely. The aerial attack under the particular bad weather conditions was like a bolt from a clear sky to the Insurgents.

The effects of the above raid might have been even better if attack planes had been employed instead of pursuit craft. Under present conditions, the ability of attack craft to function in bad weather assumes special importance. It is particularly in inclement weather, when no aerial raids are expected, that the commanders of ground forces will undertake troop concentrations, reorganization of forces, and relief of units. Attack aviation may neutralize all such hostile activity by the mere threat of attack.

We have already pointed out that attack craft should be suitable for power-dive action. Adopting these tactics, attack aviation can deliver surprise attacks in open country where prior to this method of attack there hardly appeared any possibilities of surprise raids. If such attacks were undertaken in the old manner, at low altitude, attack aviation would undoubtedly be subjected to machine-gun and even rifle fire before reaching the target, as has been the case in Spain and in China. Under such circumstances, the losses inflicted upon the attacking aircraft would naturally be great. Things, however, are different when the attack is delivered from power-dives.

Here, for example, is the result of an attack by governmental pursuit craft utilized in a power-dive action. At Alcaniz, the Insurgents after a surprise assault surrounded a group of Government forces equipped with about 50 pieces of artillery. The situation became critical. Only two alternatives were left: either to surrender the artillery to the enemy, or to remain within the complete encircling ring of the enemy, who enjoyed a great superiority in forces, with the prospects of being sacrificed to no purpose. The situation seemed hopeless. The Government air forces, however, came to the aid of their ground troops. In view of the powerful antiaircraft defense of the enemy, the Government aircraft was compelled to approach the battlefield at an altitude of 13,000 feet. Then they divided into two groups. One group, swooping down from high altitude to about 150 feet from the ground dispersed the hostile ground forces within 25 or 30 minutes. The second group meanwhile remained on guard in the air, covering the action of the first group. All 50 artillery pieces were saved from the enemy.

Attack aviation may be employed successfully against the most diversified targets behind the lines and on the battlefield.

A well prepared timely blow by attack aviation, coordinated with the action of the ground forces, in an offensive or defensive action, may produce excellent results. The most favorable moment for the employment of attack aviation is when hostile tanks are advancing to the attack followed by the infantry.

In the battlefield, the employment of attack aviation must be based upon continuous action. The attack craft should operate in groups, by echelon—delivering brief but powerful blows and attacking simultaneously the hostile centers of resistance, including antitank artillery, machine-gun nests, artillery positions and reserves. The planes should remain on the battlefield for the briefest possible moment, often appearing like a flash of lightning, but they should appear at very frequent intervals. This will serve to protect them against heavy losses and facilitate the action of their accompanying pursuit craft—which carries a smaller reserve of fuel.

Attack aviation may be successfully employed in conjunction with bombardment craft. The bombers destroy hostile fortified positions, while attack aviation destroys everything in sight, including antiaircraft artillery. Long-

range artillery weapons should support attack aviation, assisting it in silencing the hostile antiaircraft artillery.

Obviously, action of this type on the part of the attack aviation requires close coordination and careful timing of the action of the ground forces with that of the aviation, and require an uninterrupted mutual exchange of information.

Commanders must conserve their attack aviation—just as any other craft— and refrain from utilizing it unless there is special reason for doing so. At the same time, attack aviation itself must exercise due care against any unnecessary losses. Whenever possible, it should, for example, avoid flying over towns or points where hostile observation posts and antiaircraft artillery are likely to be found. Modern attack craft constitutes a powerful means for the destruction of the enemy and a vital factor in obtaining victory.

POLAND'S STRATEGIC POSITION*

[Condensed from *Polish Information Bulletin*, 15 June, 1939.]

By Lieutenant Joseph Dasher, *Military Intelligence-Reserve*

In view of the European situation today, it may be of interest to analyze the strategic position of Poland.

At first glance one is apt to assume that Poland has been successfully encircled by Germany, because the East Prussian province (separated from Germany proper by the Polish district of Pomorze) hangs over Poland from the north, while in the south there is the German controlled state of Slovakia. However, a closer scrutiny of the situation tends to show that this strategic encirclement of Poland by Germany is more optical than real, and that in actual practice both Poland and Germany would have at least equal strategic chances.

Poland and Her Neighbors

*This article naturally represents the Polish point of view.

The Slovakian Frontier

The territory of Slovakia runs along the southern borders of Poland, the total length of the common frontier being about 180 miles. Its western part is 90 miles wide, towards the east it narrows down and near the Dukla pass is not more than 45 miles. The entire area, from Zylina in the west to the Hungarian frontier in Ungvar, is mountainous and of very little value for any large scale military operations. High mountain chains reaching to 6,000 feet in some places are broken by very few passes, which run mostly from west to east, rather than from south to north. Only in the east, near the Polish-Hungarian frontier, can this territory be regarded as suitable for military operations.

On the Polish side, the frontier runs continuously along the Carpathian Mountains, which reach an altitude of 7,500 feet in the Tatras, 5,175 feet in the western part and 3,900 feet in the east. Only in the extreme west the Jablonkow Pass (1,650 feet) and in the extreme east of the Dukla pass (1,500 feet) are these mountains comparatively easy to cross.

Thus, the defense of the Carpathian Mountains should not prove difficult to Poland, for any attempt to march troops into Poland over or through these mountains, must necessarily be very costly, and questionable as to its ultimate success.

There is only one railroad track and but one automobile road in Slovakia. Both of them run along the valley of the Waga River at a distance of 12 miles from the Polish frontier. Having no branch roads leading towards the north, and being separated from the south by mountains, the road lacks any strategic importance in relation to Poland. It cannot be considered a safe road to the Dukla pass, and without Dukla and the valley of the Poprad River there can be no strategic encirclement of Poland.

On the Polish side there are five railroad lines between Jablonkow and Dukla running towards the frontier, supplemented by convenient automobile roads and converging on the main railroad lines of southern Poland, namely the Chabowka—Sambor—Lwow and the Krakow—Przemysl—Lwow lines. It is well to note, that the two most important operation centers in southern Poland, namely Krakow and Lwow, are situated within 60 miles of the Carpathian frontier.

Of great strategic importance to Poland are the Jablonkow pass and the Cieszyn area, for through that territory, with Krakow as the base of operations, an offensive can be conducted directly into the Czecho-Moravian "protectorate." A Polish offensive in that direction would serve two purposes: firstly, it would strike against a vulnerable spot in Germany's body politic, inhabited by a Slav population, bitterly opposed to German rule, and secondly, it would cut off any expedition against the Dukla pass from its only possible retreat to the west.

It can be seen that, strategically, Slovakia is more of a liability than an asset to Germany in the event of a German-Polish war.

East Prussia

From a strategic viewpoint the problem of East Prussia is even less serious to Poland than that of Slovakia.

East Prussia is a sparsely populated area of forests and lakes with excellent lines of communication and with good defensive fortifications. Defensively, East Prussia undoubtedly is of considerable value, but offensively, it would be of little importance to Germany. It should not be forgotten, that even before the World War, when East Prussia was linked by direct lines of communication with the German defensive system of Danzig, Grudziadz and Torun, the German General Staff did not consider it suitable for a base of operations against Russia.

It was only because of the inefficiency of the Imperial Russian Command, that Germany was able to achieve military success in East Prussia. Nevertheless, throughout the entire World War, East Prussia was not used as a base for offensive operations. It is hardly reasonable to presume that the experienced Polish General Staff would repeat the Russian mistakes of 1914. On the contrary, the chances are that the Polish leadership will utilize to the fullest extent every physical, moral and topographic advantage for the purpose of neutralizing East Prussia as a possible offensive base.

When it is remembered that even in 1914 military transports to East Prussia met with great difficulties from the German point of view, today this problem would present insurmountable difficulties. Separated from the rest of the Reich, East Prussia could count on supplies reaching it by way of the sea only, which, in practice means that the province would be left to its own means for supply.

With the greatest aid from the Reich, and assuming a maximum effort on its own part, East Prussia can mobilize from seven to nine divisions, i.e., hardly enough for the defense of its wide frontiers.

Left to itself, East Prussia can be attacked by Polish forces on one side from Augustow and Suwalki, and on the other from Torun and Grudziadz. These two directions converge on Koenigsberg, completely avoiding the difficult lake terrain both in the west and in the east. Even if the German Army from the Reich were able to break through Pomorze—and it is assumed that Poland will defend its access to the Baltic with every resource at its command—it would still have to cross the Vistula which is almost 3,000 feet wide, and which has no bridges between Tozew and Grudziadz, i.e., along a distance of 45 miles.

There remains the question of whether troops from the Reich can break through Pomorze, coming to the aid of East Prussia. The right flank of the attacking troops would be exposed to a Polish attack from the region of the Bydgoszcz toward Koeslin or Stolp, and would run the risk of costly defeat.

The Poznan Base

The small province of East Prussia presents a lesser danger to Poland, than the Poznan base does to Germany. The Poznan center is a direct threat to Breslau, separated by but 30 miles from the Polish frontier, Stettin—by 60 miles, or Berlin—by 95 miles.

There is no doubt that in case of an armed conflict, Poland has considerable possibilities of striking Germany in vital regions which have a defensive importance for the future of the Third Reich.

[*Editor's Note:* The Polish war doctrine is based upon offensive action as the only means to attain victory. Particular importance is given to surprise, cooperation of infantry with artillery and other arms, particularly aviation and mechanized forces.]

TACTICAL DOCTRINES OF THE ITALIAN ARMY

[Condensed from a translation of Circular 9,000, "Tactical Doctrines of the Italian Army," issued by General Periani, the Chief of Staff and Under Secretary for War, October 28, 1939.]

By Lieutenant Colonel E. M. Benitez, *Coast Artillery Corps*

Wide World Photo.

Italy Speeds Up the Occupation of Albania by Flying Troops to Cities in the Interior

Following the Italian maneuvers in the fall of 1938, new tactical doctrines were announced by the Chief of Staff of the Italian Army based primarily upon the adopted "binary" divisional organization. The chief differences between the "binary" division and the old organization may be summed up as follows:

Two infantry regiments instead of three;
A reduction in the number of machine guns;
An increase in the number of rifles, mortars and antitank weapons;
A reduction in the division artillery.

Although the unit is not motorized, its employment as an "auto transportable" division is contemplated.

The composition of the corps troops has been considerably increased and these troops now form an essential requirement for the development of the fighting capacity of the divisions. It is claimed by the Italians that by transferring weight from divisions to corps, the higher commander can achieve greater elasticity in the operation and maneuverability of the corps by the allotment of necessary reinforcements to the various divisions as required by the conditions of the moment. The composition of the corps troops as employed in the 1938 maneuvers were as follows:

Two groups each of two cavalry squadrons;
One cavalry machine-gun squadron;
One group of Black Shirts consisting of two battalions and two pack artillery batteries;
One regiment of machine guns;
One company of light tanks;
One artillery regiment 105/29-mm guns (mtz.)
One supplementary artillery "raggruppamento" consisting of:
    2 groups—149/13-mm howitzers (mtz.)
    2 groups—100/17-mm howitzers (HD)
    2 groups—75/34-mm guns (HD);
One company engineers;
One telegraphy company;
One wireless company;
One chemical company;
One air force army cooperation squadron.

The inspiration for the adoption and announcement of the present day tactical doctrines of the Italian Army came apparently from the lessons learned from the war in Spain and the successful employment of the "binary" divisions in the 1938 maneuvers in Northern Italy. In the Catalonia offensive, the Italian Corps had four divisions. The successful results of these operations leads military observers to

believe that the four-division corps (square formation) will be the rule rather than the exception in the reorganization of the Italian Army.

Extracts of the *Tactical Doctrines of the Italian Army* as recently published is given below.

Foreword

The principles which have determined the transformation of the Italian basic large unit—"the division"—and the consequent changes in the organization of the corps are today known to all superior officers of the army.

The experimental phase was closed by the maneuvers of autumn 1938 and it is now necessary to bring to the knowledge of all officers of the cadres, the conclusions reached.

The Italian war doctrine remains unchanged, in view of the fact that the conditions under which a conflict would be fought today have not changed. However, said war doctrine progresses and is further developed. It must derive from the new organization a greater possibility for development and must be supported by commanders mentally prepared to encourage such a development.

I. *Movement*

The value of any principle lies in the intensiveness with which it is felt and enforced.

It is not sufficient to accept the principle of the "war of rapid decision" as a manifestation of a doctrine imposed on Italy by its particular situation. Commanders and staffs must be inspired by that "operative strength" capable of creating on the battlefield the conditions required for its successful solution. These conditions may be briefly defined as "movement."

As an expression of collective will, movement is in itself a manifestation of superiority. Maneuver materializes and accentuates its results.

The employment of the mechanical means in ever-increasing proportions and the offensive power of aircraft outlines a complete picture of future warfare, in which an insufficient capability of movement would frustrate the results of success and would increase in an unforseeable measure the consequences of failure.

Safety against any surprise, secured by suitable organization, and information concerning the enemy's intentions, made possible by an active reconnaissance, create for movement the fundamental conditions for its development.

Preponderance of fire and the rapid building up of the attack insure the success.

The halt during movement, unless it is the consequence of special operative intentions, is a condition of crisis due principally to two things:

(a) The moral or physical depression of troops;
(b) Defective organization.

The depression of troops may be due to various causes, foremost of which are surprise, material losses on account of the enemy action, and excessive hard conditions; in short, to factors which diminish the faith in the commanders.

The organization, as a fundamental condition of operative efficiency, embraces all fields: tactical, technical, logistical.

Without a spirit of organization kept always alert even in the most critical moments of the battle, it would be useless and even dangerous to take into consideration those powerful concentrations of means which are the basis of a conclusive action.

In the practical training, maximum weight must be given to the development of this factor, a fundamental one for carrying out command.

Actions carefully studied and organized, even if very risky, are almost always successful if carried out with real impetus.

Therefore, side by side with the spirit of organization, must be encouraged the love of risk, which gives in turn the satisfaction of responsibility.

Risk must not be an individual heroic action but a well balanced manifestation of will which magnifies a hundred times the results of decision.

Many old ideas must be eliminated in this field. The distance between prudence and inaction is not great and is easily passed by those who do not cultivate the love of risk.

II. *Large Units*

The infantry division is the basic large unit in combat intended in a particular manner for shock and penetration.

It has a fixed organization and acts as an indivisible unit.

If its operating capacity must be adapted to particular tasks or to independent employment, higher headquarters will complete it by assigning to it the necessary means.

The Corps is the large unit for maneuver. It is the fundamental unit of the battle and may carry out within the zone of the army, with its own means, several phases of the combat.

Its organization may include from 2 to 4 (and even more) divisions. However, when 3 divisions are included, it has an excellent proportion between its elements, well balanced offensive power and maneuverability.

The corps commander maneuvers his divisions on the principle of economy of force. Irrespective of the size of the sector assigned to his corps, he must converge its action towards one objective only—the most important—taking from the main effort only those means which are absolutely indispensable to better guarantee the development and the success of his action.

The Army is a strategical and logistical large unit, the organization of which is varied, and responding to the purposes of the maneuver assigned to it.

The Group of Armies may be formed if necessary, with exclusively strategical tasks, aiming at coordinating, on a given front or on a part of it, the action of the dependent armies.

III. *Principles of Employment*

The regulations in force at present retain their entire value. However, they must be applied by keeping in mind the different functions assigned to the division within the scheme of maneuver of the corps.

The tasks of the division commander shall be limited to:

(a) The organization for combat of his own division, with a view to a single objective to be attained;

(b) The conduct of combat, intended above all as the coordination of fire and movement.

In other words, the aim is to secure

(a) A more timely exercise of command functions.
(b) A simpler engagement of the mass.
(c) A more intensive building up of the attack.
(d) A more rapid rhythm of action.

Therefore, maneuver—the most important task of the corps commander—will be facilitated by the "passing through" of units, rendered more rapid by the deployment already carried out of the artillery of the division (or divisions) of the second echelon.

It should be stated that the word "maneuver" signifies, in this instance, the sum of actions carried out by large units, coordinated in time and space in order to secure decisive results in the battle.

This denomination must therefore be reserved to the field of Grand Tactics, and attainment of major objectives.

The development of maneuver, thus understood, is carried out by processes of action which, exploiting the terrain and the possibility of fire, aim at concluding combat with the least possible losses.

In the following very short picture of the employment of the corps and of the division in offensive and defensive action, we shall confine the discussion to those problems which assume a particular aspect due to the new organization of those two units.

Offensive Action

March to the Enemy

The corps marches to the enemy in a sector of advance that coincides, as a rule, with the zone of action. This sector is characterized by a direction specifying the main line of advance, and includes several successive objectives, in accordance with the plan of maneuver of the army.

To move during night is a good rule, but very difficult of execution.

Should it be necessary to move large masses in the day time, the movements must be coordinated with the practical possibility of antiaircraft defense (aircraft, antiaircraft fire, artificial fogs) or with favorable atmospheric conditions.

The case will often present itself where information of the enemy gathered by aerial and ground reconnaissance will be insufficient to orientate the corps commander, He must, nevertheless, advance within the radius of action of the enemy large units with the idea of committing his large unit to an immediate offensive deployment.

This means that the divisions of the first echelon must be already deployed into distinct groups, thus decreasing the aggregate depth and the visibility, with the advantage of being able to pass to combat without delay.

The large units of the second echelon and those further in the rear, advance under the protection of the large units of the first echelon, keeping in communication with them and particularly taking care of the logistic necessities and protecting themselves against enemy aerial offensive.

When the situation so warrants and the terrain makes it possible, the security dispositions of the infantry divisions of the first echelon, may (with the purpose of saving time and space) take forms even substantially different from those prescribed, such as the employment of fast elements for occupying advance localities particularly suited for the protection of the movement of the following large units.

A march to the enemy requiring extraordinary and unusual time and effort has the same negative value as an unfavorable engagement.

Preliminary Engagements

The last phase of approach is concluded, as a rule, by a series of preliminary engagements coordinated by the corps commander. They form the operative preliminary phase before the decisive attack which, on account of the inevitable reactions of the lateral large units, must be ordered by the army commander.

The preliminary engagements aim at: Feeling out the enemy in order to determine his strong and weak points; improving, by occupying certain positions, the possibility of observation and in general the conditions of attack, insuring safety to the deployment of the large units.

The proportion of the forces and the type of action vary in accordance with the terrain and the aims. Normal principle: support the infantry with a large employment of tank units and strong artillery support.

The Attack

Between the preliminary engagements and the decisive attack there may be a short or long interval which represents a loss of time, to the advantage of the enemy. As it is impossible to eliminate totally such interval, it must be reduced to the minimum and this is possible if the entering into action of the large units has been organized tactically and logistically.

The most profitable maneuver is evidently that which tries to envelop the flanks and the rear of the enemy deployment; in view of the fact, however, that the enemy reaction is inevitable, a continuous, defensive front will be encountered normally. It will therefore be necessary to break this front in the most advantageous direction by means of a series of powerful blows by the division, at the shortest possible intervals until the reactive capacity of the enemy is annulled and until favorable conditions have been created for the envelopment and the collapse of the various sections of the enemy front.

The particular ogranization of the corps and its nucleus of supplementary troops permits the commander to concentrate the maximum effort in the selected direction and to develop the maneuver under conditions of safety (employment of machine-gun units at the wings and in the intervals between troops).

The terrain, evaluated strength of the enemy organization, sector of attack and depth of the objectives assigned to the divisions of the first echelon are all interdependent factors.

The greater the echelonning in depth the greater the capacity for shock and penetration. However, this action finds a natural limitation in the necessity of insuring a suitable front to the shock unit.

For an approximate evaluation of the front to be taken by the large units, it may be assumed that the divisions of the first echelon "encadrés" (as part of a corps) will operate over an average front of 1,000 to 1,600 yards.

The offensive action of the infantry division "encadrés" is *unitary*, i.e., one purpose, one direction. The maneuver, that is, the determination of the direction of attack and the importance of the effort in each direction is decided upon by the corps commander.

The deployment (echelons and number of battalions to each echelon) is decided by the division commander.

The employment must be carried out in accordance with the following principles:

(a) Aim straight at the established objectives without engaging in separate actions which may divert from the main objective.

(b) Never break the attack into principal actions and auxiliary actions.

(c) Feed the attack, within the division, following the idea of concentrating the effort at those points where success is indicated.

As a rule, artillery acts with all of its means from the very beginning of the attack.

Its function is to insure the rapid movement of the infantry with the minimum losses; its deployment and fire must, consequently, answer this purpose fully.

Divisional artillery, reinforced with that from the corps, operates under the command of the division commander. As a rule, all this artillery will be divided into two groups: the first supporting the battalions of the first echelon; the second, ready to support the first or—as is frequently the case—to extend its action in depth and laterally.

The corps commander should not hesitate to increase the mass of artillery in action, using for this purpose the artillery of the divisions of the second echelon, if in his plan of maneuver he foresees that he will have to use the units of the second echelon, in "passing through" in a given direction, in order to pass rapidly from the shock to the penetration into the enemy organization.

The minor wear and tear of artillery in comparison to infantry, permits the total employment of the groups of the divisions of both the first and second echelons for the entire duration of their action.

When a part of the enemy front has collapsed, the success must be completed immediately in width and depth so as to extend and consolidate the breech secured, thus facilitating the prompt intervention of the special large units destined to the exploiting of the success.

The employment of the divisions of the second echelon is not materially different from that of the divisions carrying out the first shock; their unitary action and the intensity of penetration must however be intensified (without breaking them down into small columns or tactical groupments), so as to cause the collapse of the pillars of the enemy defense and prevent the enemy reserves from closing the gap.

Defensive Action

When it becomes necessary, for any reason, to take a defensive attitude, the principle is: exploit the terrain and means to the maximum with the purpose of wearing out the enemy and reassume the offensive as soon as possible.

The defensive action is carried out as follows:

(a) By a plan of resistance obtained chiefly by adapting fire to terrain, organized in all of its details.

(b) By counteroffensive action, carried out at the suitable moment with great force, when the enemy attack is stopped or worn out.

The new organization of the corps (considerable increase in artillery, availability of an entire machine-gun regiment) permits increasing the echelonning of the defense in depth and the assigning to the elements of the security zone the function of wearing out the enemy attack.

In said zone—which must have a depth in proportion to the means available (normally 1.2 to 1.8 miles) there will be one or more "delaying positions" (occupied by machine-gun units and antitank weapons only) organized with a view of making the enemy's advance more costly and much slower.

Greater depth is always advisable when a mass attack of tanks is expected.

An infantry division occupying the position of resistance is deployed—as a rule—in two echelons and is reinforced by units from the machine-gun regiment of the corps.

Its sector will be, in principle, 1.8 to 3 miles wide or even more if, for instance, protected by a river.

Normally, the infantry divisions of the first echelon receive artillery reinforcement from the corps. The division commander, having worked out the plan for the employment of fire, indicates from among the available groups, those designated to the defense of the various sectors and those designated to constitute the mass of maneuver.

Conclusion

The typical division and the corps, on account of the fire power that they can develop and the utilization of motorization on a large scale, are particularly suited for that shock of masses—maneuvered and resolute—by means of which the Italians expect to attain a rapid solution in battle.

It is evident that these large units find an ideal fighting terrain in regions of only average difficulties. Should they be employed over terrain which, due to its characteristics, greatly increase the difficulty of movement (both from a tactical and logistical point of view) it will invariably be possible, with the intervention of the army, to render the division and the corps suitable to the terrain and to the objective to be attained, by assigning to them the indispensable means.

By adapting the organic means of a given unit to its normal tasks and by increasing those available to higher headquarters, it is aimed to give to the latter, in any circumstance, the possibility of creating an operative instrument which, on account of its strength and organization, will be able to secure victory.

JAPANESE CAVALRY IN THE WAR WITH CHINA

[Condensed from an article in *Krasnaya Konitza*, No. 2, 1939.]

By Lieutenant Colonel E. M. Benitez, *Coast Artillery Corps*

Among the armed land forces of Japan, cavalry—both independent cavalry and army cavalry, and particularly the

latter—is not the arm of least importance. The independent cavalry is organized into five separate cavalry brigades, three of which are stationed in Manchuria, and two in North China. The army cavalry consists of separate cavalry regiments and "battalions"—units of two squadrons—which form part of the infantry division.

The comparative weakness in cavalry resources—particularly as regards horses suitable for cavalry purposes—does not permit Japan to develop independent cavalry, in spite of the fact that the Japanese command has made such efforts. The lack of horses was one of the causes for the station assignment of the new cavalry units. The Japanese command is trying to keep independent cavalry in Manchuria and North China so as to mass it for a war against Soviet Russia.

The separate Japanese cavalry brigade consists of two regiments, an artillery detachment, tank detachment, antiaircraft detachment, gas detachment and train. The strength of the brigade is 2,800 men and about 3,000 horses. The armament of the brigade consists of about 1200 carbines, 32 light machine guns, 16 heavy machine guns, 4 light 75s, 6—37-mm antitank guns, 10 light tanks and 9 armored cars. In addition, there are means for antiaircraft and gas defense.

The cavalry regiment of the first line infantry division consists of two saber squadrons and one machine-gun squadron with a total of 460 men and 460 horses. The armament of the regiment consists of about 380 rifles, 8 light and 8 heavy machine guns. In the second line division there is a cavalry "battalion" (unit of two squadrons) instead of a cavalry regiment. The training of the tactical unit of Japanese cavalry in peace time aims at the protection of the action of the infantry division.

The training of the independent cavalry stationed in Manchuria of late years has been carried out with the following aims in view:

(a) Mastery of the new matériel introduced into Japanese cavalry (tanks, armored cars and antitank cannon) and the working out of methods of cooperation with units equipped with this matériel.

(b) Covering the deployment of the armies from the enemy cavalry.

(c) Offensive operations of the cavalry groups against the enemy's infantry and artillery.

During the last six or seven years, the cavalry maneuvers have been carried out in Manchuria with the enemy side having an organization very similar to that of the Soviet Army.

At the beginning of the military operations in China, the Japanese command sent to North China two cavalry brigades which subsequently participated in the battles near Kalghan and Suiyang.

There is no detailed information concerning the action of independent Japanese cavalry in China. According to foreign press reports the cavalry units were used in the area north of Paoting. Here, when the fields were sown and the roads were bad and it was difficult for the infantry and moto-mechanized units to operate, cavalry was used extensively for encircling operations and distant reconnaissance for the army. Foreign military observers, in summing up the preparation of Japanese cavalry and its use in China, have expressed their conclusions as follows: large cavalry formation, in conjunction with motorized-mechanized formations can be used effectively for pursuit and encircling operations.

In a theater of operations such as North China, where the character of the region and the large number of rivers make it difficult for other kinds of troops to operate, the use of cavalry is highly advantageous. For maneuvering operations on the offensive against important objectives and also in missions which require the holding of an important line, the fire power of Japanese cavalry proved insufficient, hence the Japanese have tried to strengthen its fire means. The general opinion seems to be that Japanese independent cavalry today lacks in fire and striking power. As it can be seen, even the limited experience of the war in China has revealed these deficiencies.

Japanese army cavalry has been put to more extensive use in the war in China. In this war the cavalry regiments and the squadrons of infantry divisions have been used for the execution of the following basic missions:

(1) Protecting the flanks and the "junction" units of the division.

(2) Tactical reconnaissance for the division.

(3) Security on the march.

Sometimes the division cavalry has been used for operations against the enemy's rear. For example, in September 1937, near Faoting, one cavalry regiment of the infantry division, reinforced by a company of infantry, was ordered to move out on the flanks, to establish communications and make possible joint action with the neighboring unit, to press the enemy and, during the general offensive of the division, to strike the enemy's rear. The depth of the action of the cavalry regiment was about 120 miles.

Army cavalry has also been used in pursuit of the Chinese forces. However—in the first period of the war—cavalry, in the performance of this mission, met with serious difficulties because the Chinese troops took advantage of the lack of artillery and weak fire power of the Japanese cavalry by taking shelter behind the villages' walls where the Japanese could not dislodge them with the fire of small arms and machine guns only. Later on the Japanese division commanders on sending out cavalry regiments to pursue the Chinese units, attached to them separate cannon and small tanks in order to reinforce their fire power.

Cavalry units also performed missions of distant reconnaissance. Division cavalry was used for this purpose in covered terrain when the air forces were unable to furnish information concerning the enemy. For example, in the operations on the left bank of the Huto River (to the northeast of Taiyuan) Japanese aviation reconnaissance could not discover the presence or absence of Chinese forces. A distant reconnaissance mission was assigned to one of the divisional cavalry regiments. However, cavalry regiments are not, as a rule, sent out on distant reconnaissance missions, due to the fact that the extensive operations of Chinese units in the rear of the Japanese lines hinder the use of separate cavalry regiments and threaten them with destruction.

It is interesting to note the efforts of the Japanese to strengthen the marching capacity of the cavalry. In order to lessen the fatigue of the men and horses, particularly

when they are passing over marshy regions, Japanese cavalry began to practice marching at a walk. By doing this they decreased the number of halts and the duration of them, but at the same time they maintained the normal length of the day's march. Moving at a trot or a gallop was used only on the field of battle.

In the disposition of their forces during halts, the Japanese have tried to protect them behind the walls of the villages so as to secure them in some degree from surprise attacks by Chinese guerrillas.

The use of army cavalry by the Japanese in China has not differed from the provisions of their regulations. The war in China has shown the Japanese the shortcomings of the organization of their army cavalry and particularly its weakness in fire power. There is no doubt that the High Command of the Japanese Army will make every effort to devise a better cavalry organization and will correct in the future the deficiencies shown in the war in China.

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The following item has been taken from the April, 1939 edition of the *Tokyo Gazette*, Tokyo, Japan. The *Tokyo Gazette* is a monthly report of current policies, official statements, and statistics of the Japanese Government:

> "Many things hitherto unnoticed even by the thinking public have been brought to light, frequently with new emphasis and implications, through experiences undergone on the China and home fronts in connection with the present conflict. The usefulness of the horse in modern warfare is one of such discoveries. In reality, without the services of this dumb, faithful animal, Japanese troops would not have been able to carry out successful, daring attacks upon enemy positions, particularly in battles on the rugged steeps and in the narrow passes of the Chinese mountains. Contrary to popular expectations, the increasing mechanization of the Army has by no means diminished the utility of army horses. The present hostilities have certainly established their distinct place in modern warfare."

FIELD ORGANIZATION OF THE SERVICES OF SUPPLY IN THE GERMAN ARMY

["L'organizzazione dei servizi di campagna nell' esercito tedesco." by Colonel Ugo Ferrero. Condensed from *Rassegna di Cultura Militaire*, July-August, September 1938. Translated from the Italian in the Translation Section, The Army War College, Washington, D. C.]

By Lieutenant Colonel E. M. Benitez, *Coast Artillery Corps*

In the reconstruction of the German Army, accomplished during the past two years, the services of supply have been reorganized into a system capable of fulfilling the complex requirements of a modern army.

The three fundamental needs of an army in the field are: supply of everything that the troops require to live, to move and to fight; care of sick and wounded men; and similar care for animals. With this in view, the "services in rear of the operating troops,"* or *Rückwärtige Dienste* have been organized in three principal branches—the supply, sanitary and veterinary services.

Of these branches, the first in importance is the service of supply (*Nachschub*), because it is the artery connecting the operating army with the source of supply in the home country, and is required to furnish the troops with everything required for use in the field.

Attached to the services of supply (*Heeresversorgung*) are several subsidiary services—the military police service in the rear areas (*Ordnungsdienst*); the military postal service; and the great organization for the exploitation and use of establishments existing in the theater of operations.

The most advanced elements of the services are integral parts of the operating troops.

Evacuation of everything that might hamper the activity or mobility of troop units in the first line (sick and wounded men and animals, prisoners, materials in need of repair or unserviceable; surplus materials, captured matériel) is handled by each service within its own province.

In so far as the services are concerned, the territory is divided thus:

(1) Zone of the operating armies, which includes the entire theater of war (*Operationsgebiet*);

(2) Zone of the services (*Rückwärtiges Gebiet*), or the rear zone within which the services carry on their varied activities.

The scheme of organization is as follows:

- Services of the front-line units
- Services in rear of the operating troops
  - Service of supply
    - Ammunition service
    - Motor supply service
    - Repair and replacement service
    - Quartermaster supply service
  - Sanitary service
  - Veterinary service
  - Military police service in the rear areas
  - Military postal service
- Service for exploitation and use of establishments existing in the zone of the operating army.

More specifically, the various branches of the service of supply are charged with the following duties:

The *ammunition service* with the supply of ammunition for all arms, of hand grenades, explosives and incendiary material; that is to say, the service is concerned exclusively with supply of ammunition and similar material, and has nothing to do with arms and other heavy material.

The *motor supply service*, with supply of fuel, lubricants and tires.

The *repair and replacement service*, with supply of motor vehicles and materials pertaining to them, including spare parts; arms and materials which are damaged or unserviceable; and with means of field transportation in general. It thus includes functions which in other armies are distributed among the ordnance, engineer and lines of communication services.

Quartermaster supply service; with supply of rations, forage, clothing, equipage and finance. This service was

*This expression, or "first line troops" is taken in this article to include troop units not above the regiment or equivalent organization.

formerly called the "Intendantur"; this term is no longer in use, although the officers of the service are still known as "Intendants." The service is now designated as the "Verwaltungsdienste."

"Services in rear of the operating troops" belong to armies and divisions, and to a limited extent to the army corps. The whole service is centered in the army. The division, as an operative unit (*Operative Einheit*), is provided with such services as assure to it, within the army an independence proportioned to its missions. During the World War, the corps was considered as the operative unit, and as such was provided with all the necessary services, and the division, with certain exceptions, did not have them. The corps is now provided only with the services strictly indispensable for the corps troops, except the cavalry corps, which have the same services as the cavalry divisions. Nevertheless, as a unit intermediate between the army and the division, the corps has the important function of coordinating the operation of the services with the tactical dispositions—that is to say, of regulating the supplies to be furnished to the divisions with regard to the situation.

Organization of the services in rear of the operating troops

Coordinating agencies.—The quartermaster general at G.H.Q. and the Army Quartermaster at Army Headquarters, are responsible for the operation of all the services.

In 1914 the organization of the services was based upon the regulations for the lines of communication (*Kriegsetappenornung*). All supply was placed under the direction of the lines of communication (*Armee-etappenspektionen*) and the army commanders had no effective control over the operation of the services.* But during the battle of the Marne, in September 1914, the commander of the German First Army was compelled by the intricate situation which arose in the rear areas, to assume control of the movement of supply agencies during the movements from the Marne to the Ourcq and from the Ourcq to the Aisne. In view of the difficulties involved, the logistic direction of the services was assigned to the armies, early in 1915.

Operating agencies of the services in rear of the operating troops

Supply columns.
- Motor supply columns, G.H.Q. (heavy)
- Motor supply columns, army (light and heavy)
- Divisional supply columns (light motor or horsed)
- Corps supply columns
- Pack trains (in mountain warfare only)

Divisional gas and oil columns, light and heavy.
Motor repair shops, army and division.
Army parks—infantry, artillery, pioneer, signal, motor.
Army depots, ammunition and subsistence.
Service units—battalions in the army, companies in the division.

Specifically, the supply columns provide for supply of ammunition, explosives, rations and forage, arms, clothing, equipment, means of transportation, horses and material of all sorts required by the operating troops. They are also charged with evacuation of arms and material of all sorts, damaged or unserviceable, surplus material, and captured material. In special cases they may be called upon to assist in evacuation of sick and wounded men and animals.

G.H.Q. reserve columns and army columns are entirely motorized. Divisional columns are partly motorized and partly horse drawn.

The division gas and oil columns are reserved exclusively for supply of tires, fuel and lubricants, for all military motor vehicles.

The army ammunition and subsistence depots provide for the supply of their respective stores. The subsistence depots carry, in addition, small stocks of clothing and equipment.

The army service battalions or the divisional service companies are made up of ammunition, subsistence, salvage and technical platoons; they furnish railheads with the men necessary for handling, storage and issue of supplies.

Supply columns

The G.H.Q. motor supply columns, heavy (useful load 60 tons) constitute a reserve of transportation at the disposition of the quartermaster general. The army motor supply columns, light and heavy (useful load respectively 30 and 60 tons) provide a rolling reserve of ammunition, rations and forage, for the re-supply of the depots and parks.

The divisional supply columns (light motor or horse drawn, useful load about 30 tons) carry a part of the "initial supply," corresponding to our "day of fire" or "day of rations and forage."

The corps supply columns are charged with the supply of corps troops only; except that the supply columns of the cavalry corps are in general charged with supply of ammunition, rations and forage (chiefly oats) for the cavalry division columns.

Pack transportation is little used in Germany; pack trains are assigned only to units operating in the mountains.

Gas and oil columns

Like the supply columns, these are divided into light and heavy, according to carrying capacity. They are assigned to divisions, and are charged with the supply of fuel, lubricants and tires, for motor vehicles assigned to first line units, headquarters and service units.

Means of transportation assigned to first line units

Light regimental (or independent battalion) columns.
Combat trains:
- Combat vehicles or battery combat trains
- Rolling kitchens
- Led horses.

Subsistence trains:
- 1st Echelon (horse-drawn), second echelon (motor), or one echelon (motor) for motorized units.

Baggage train: motor.

The light columns (of varying composition according to arm) are largely motorized and carry ammunition, pyrotechnics, explosives, camouflage material, and small stocks of arms and implements.

*Colonel Theodor Jochim, "The operations and the lines of communication of the German First Army in the battle of the Marne, 1914." Mittler, Berlin.

Combat trains

These carry ammunition, spare parts of arms, tools for minor repairs, medical and veterinary equipment.

The field kitchens (horsed or motorized) are fitted for cooking on the march, and also carry one day's field and one day's reserve rations. The led horses are intended for the use of heavy weapons and artillery.

Transportation for rations

1.—Units not motorized.—The first echelon, horse-drawn, consists of one wagon per company and two per squadron or battery; it carries one day's rations and forage. The second echelon, motorized, consists of one medium truck per battalion or corresponding unit, and carries a second day's rations and forage.

2.—Motorized units.—There is only one echelon, consisting of one truck per company or corresponding unit; it carries two days' ordinary rations.

Baggage train

This consists of one truck per battalion or equivalent unit. It carries ¾ of the personal equipment of the soldier (the remaining ¼ being on the men), officers' baggage, and a small stock of clothing and equipment.

The services in the division

As a rule, the division has no depots of ammunition, rations or forage; its own supplies are kept mobile, in the division supply columns, especially in those which are motorized. For issues to the troops, distributing points for ammunition, rations and forage are established by the division itself; these distributing points carry also small stocks of clothing and equipage. They are normally supplied directly by the army motorized columns, except for bread and fresh meat, which are received directly from the specialized bakery and butchery companies, which are provided with transportation for the purpose.

When the distance between the army depots and the issue stations is too great, refilling stations are established by the army or sometimes by the divisions, to which the army columns bring supplies for reloading upon division transportation.

On the march in the vicinity of the enemy, the division supply columns are united with elements of the other service units, into a "march echelon," which follows the motorized echelons of the first line division units. This march echelon is commanded by an officer assigned by the director of supply of the division; its movement and use is controlled by special orders from the director, through the division commander.

In action, parts of the various division supply columns may be combined into a single echelon, under command of the senior column commander; and parts of the horse-drawn columns may be combined into a "combat echelon," which is pushed well to the front to supply the front-line units.

For the supply and maintenance of motor transport, the the gasoline trucks of the division will refill at the gasoline truck park of the army, which is generally established at the army railheads. The gasoline trucks of the division refill the supply trucks of the motorized units (one for each basic unit), and a park is established for supply of command cars and the various motor vehicles of units not motorized.

The division carries no stocks of arms, or of artillery and engineer material. For arms, motor vehicles and other matériel, unserviceable or requiring repair, the division provides for evacuation when necessary, through salvage stations.

Distribution of supplies, and mechanism of supply system

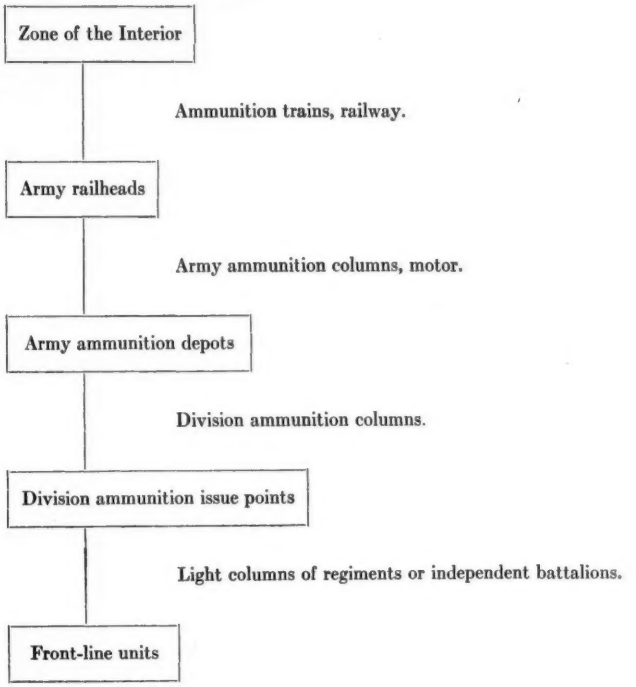
Ammunition supply

The initial supply of ammunition of the division (day of fire) is distributed as follows:

An individual allowance is carried on each man, and a similar allowance for each weapon is carried on the gun or mortar carriage. A unit allowance is carried in the combat trains, and in the light columns of the regiment or independent battalion. The remainder of the initial supply is carried in the division and army ammunition columns.

In exceptional cases, where there is a long distance between the army depots and the division issue points, ammunition refilling points are established, where amunition carried in the army columns is transferred to the division columns.

In case of necessity the division columns assist the light columns of the troop units in supply. In action, troop units may be supplied on the spot by detachments of the division columns consolidated into a "combat echelon."



Normal Procedure for Ammunition Supply

Supply for motor vehicles

Distribution of allowances:

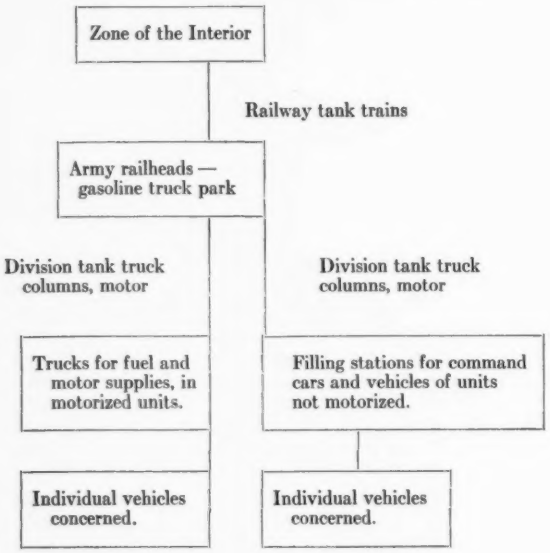
1.—In the tanks of the vehicles of the troop units.

2.—On the motor supply trucks of the motorized units (habitually one for each company or corresponding unit).

3.—In the gasoline tank columns of the division.

Repair and replacement

Minor repairs to motor vehicles are made in their own units, which are provided with spare parts and tools for this purpose; or in the motor repair shop of the division or army. For more serious repair the damaged vehicles are sent to the army motor park or to the shops and manufacturing establishments in the interior. Replacement vehicles, including fighting machines, are sent from the army parks.


Zone of the Interior
Railway tank trains
Army railheads — gasoline truck park
Division tank truck columns, motor
Division tank truck columns, motor
Trucks for fuel and motor supplies, in motorized units.
Filling stations for command cars and vehicles of units not motorized.
Individual vehicles concerned.
Individual vehicles concerned.

NORMAL PROCEDURE FOR SUPPLY OF MOTOR FUEL AND OIL

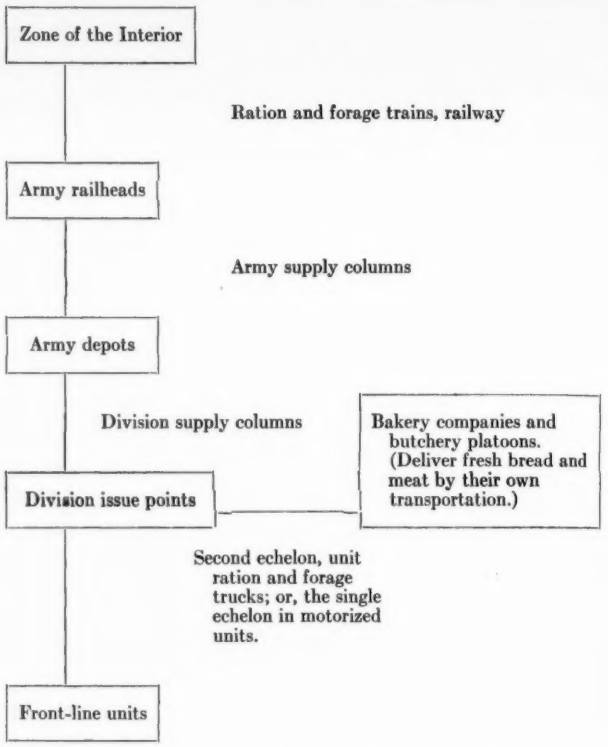
Subsistence service

Distribution of rations and forage allowances:

(a) Men: 4 fresh rations and 2 reserve rations, distributed as follows:
- 1 regular ration with the field kitchens;
- 2 regular rations in the unit ration wagons;
- 1 regular ration in a section of the division supply column, as a rolling reserve;
- 1 reserve ration, reduced, on the man;
- 1 reserve ration, complete, with the field kitchens.

(b) Animals: 4 grain and hay rations, and 1 reserve ration, distributed as follows:
- 1 on the horse or on the horse-drawn wagon;
- 2 in the forage wagons;
- 1 in a section of the division supply column, as a rolling reserve;
- 1 reserve ration on the horse or horse-drawn wagon.

In exceptional cases, where the distance between the army depots and the division issue points, ration and forage refilling points are established, where the division columns are refilled from the army columns. On the other hand, when the railway net and the military situation permit, train loads of rations and forage may be pushed up to advanced railheads near the divisions, for the direct refilling of the division columns.


Zone of the Interior
Ration and forage trains, railway
Army railheads
Army supply columns
Army depots
Division supply columns
Bakery companies and butchery platoons. (Deliver fresh bread and meat by their own transportation.)
Division issue points
Second echelon, unit ration and forage trucks; or, the single echelon in motorized units.
Front-line units

NORMAL PROCEDURE FOR SUPPLY OF RATIONS AND FORAGE

CONCLUSION

From this hasty sketch, the simplicity of the organization is apparent. Especially worthy of note is the division of the system of four branches corresponding to the four fundamental and distinct requirements of the troops—*ammunition, gasoline and oil, arms, rations and forage.*

But a second characteristic, no less important, is the almost complete motorization of the columns, and the abundance of motor transport assigned to them, to enable them to conform to the rapid movements called for by the war of movement and to maintain uninterrupted service in spite of sudden changes in the situation. All this conforms to the most modern conception of the conduct of war.

A part of the division supply columns and of the first line unit transportation remain horse-drawn, but only for the purpose of maintaining direct contact with the operating units off the roads, on ground where the motorized elements cannot always go. In case of necessity, it is provided that oxen may be substituted for horses.

The greater mobility and speed given to the field supply services through their almost complete motorization give them much greater capacity for solving the difficult problems placed before them. To this conception of swift adaptation to changes in the situation, is due the idea of keeping a part of the allowances of ammunition and rations loaded in the supply columns.

Germany has based the reorganization of the services of supply upon the development of motorization and mechanization in the combatant units, and upon the extraordinary progress in armament. She has thus created one of the essential conditions to enable the new military equipment to fulfill the functions expected of it. The final success resulting from victories on land or sea or in the air, is

based upon the supply demanded by men and arms; just as the triumphant human strength, mental or physical, is directly dependent upon the inevitable conditions of life in the physical organism.

POCKET ARTILLERY

[Condensed from an article by I. Khorikov in *Voyenny Viestnik* (Russia), December 1938. Translation by Historical Section, Army War College, Washington, D. C.]

By Lieutenant Colonel E. M. Benitez, *Coast Artillery Corps*

The hand grenade is the "pocket artillery" of the soldier. It may serve a variety of purposes and is especially adaptable for use in close combat and sudden encounters with the enemy. As demonstrated by the experience in Spain and China, the hand grenade is indispensable in street fighting and in trench fighting.

The hand grenade is best suited to use in instances where other weapons are ineffective. The action of the artillery, trench mortars, and rifle grenadiers must be curtailed when closing in upon the enemy because of the dispersion of shells and wide burst effect.

The infantry possesses grazing fire weapons—machine guns and rifles—which it may utilize against the enemy, but these weapons are quite ineffective against an enemy in covered positions, such as dugouts, pits, buildings, shelters, thick hedges, walls and fences. It is in instances of this nature that the hand grenade may be employed successfully at a range up to 70 yards.

When used in quantities, hand grenades constitute an effective weapon for use by the infantry against hostile tanks.

In battle, hand grenades are employed in conjunction with other weapons—except in defense—against sudden individual attacks, when the hand grenade is utilized to greater advantage against the attacker.

The tactics involved in the employment of hand grenades are substantially as follows:

1st method. The enemy is driven under cover by means of grazing fire. This action is then followed up by the concentrated use of hand grenades to destroy the enemy in his covered position. Should the enemy find it impossible to withstand the grenade action, and venture out of his covered position, he is again subjected to a devastating grazing fire.

2d method. The enemy who has taken refuge in shelters, or buildings, is forced to abandon them through the aid of hand grenades, whereupon he is destroyed by means of grazing fire. This method is adopted in trenches, towns, settled areas and woods. The same method may be used against hostile tanks: The tank is halted with the aid of a concentration of grenades, which is followed by the action of the antitank gun, which puts the tank out of action. Then, if the tank crew abandons the machine, it is destroyed by machine-gun and rifle fire.

3d method. Just before destroying the enemy in hand-to-hand fighting, he is momentarily halted with hand grenades. Ordinarily, this is undertaken simultaneously with the bayonet charge or timed to coincide with the launching of the counterattack.

The hand grenade is thus an effective, potent and indispensable weapon in close combat. It was introduced during periods of intensive close combat actions. Thus in the Russo-Japanese War, during the defense of Port Arthur, the Russian forces began making hand grenades from tin cans by hand. The initial position warfare battles fought during the World War restored the importance of the hand grenade, which had been forgotten after the Russo-Jananese War of 1904-1905. The recent experience in Spain and China firmly establish the importance of the hand grenade in close combat.

Hand grenades are employed primarily in close combat and during surprise attacks. The experience of recent campaigns has demonstrated the fact that attacks are quite often launched at night, at dawn, at dusk, or in bad weather, during storms, rain and blizzards. Considering the fact that all of these special conditions will exert certain influences upon the use of the hand grenades, it is necessary to introduce appropriate changes covering the same in the instructions involved.

Study of the grenade construction. The grenade is constructed with a view to its employment under normal conditions. Of course, placing the cap upon the grenade and its examination prior to throwing are the most important factors in its utilization.

An effort must be made to arm the grenade under normal visibility conditions. There may be instances, however, when it will be necessary to arm the grenade at night, and the soldier will have to accomplish this by touch. Under no circumstances, however, should the grenade be thrown without verifying its condition of readiness.

The soldier should be instructed first how to arm the grenade and to verify its readiness in daytime by touch. Common errors must here be explained to the soldier on the spot. Next comes the discharge of the grenade by touch. After this, all work should be undertaken in semi-darkness or darkness. The instructor should make his check of the work of his students also by touch. A flashlight may be used to illuminate the grenade while pointing out errors to students.

Skill in the use of grenades by touch is important not only for the employment of the grenade at night but in daytime as well in cases where it is necessary to work in poor light, in covered places, in cellars, in buildings with closed windows, etc.

Training in the art of throwing grenades. First of all it is necessary to decide with respect to the point whence the grenade is to be thrown, its target, the manner in which it is to be thrown, and range. All this must be decided momentarily. The training here involved should be so organized as to instruct properly the men in prompt but accurate utilization of the grenades under any and all circumstances.

With this object in view, it is necessary to determine first of all *where* the grenade may be thrown. In the case where some high walls, fences, trees, buildings, or poles, happen to be nearby, a grenade, upon striking these objects, will bounce back and strike the thrower without hitting the

enemy. Hence it is necessary to make a study of the locality in daytime.

For night action, or for action under conditions of poor visibility, the men should note any marks by which they could find the directions where the grenades may be thrown with safety. White paper, light rocks, new (light) boards, and similar objects, may here serve the purpose.

A man stationed at his post makes a study of the points where grenades may be properly utilized. The instructor verifies the work of the student and discusses the various problems involved.

In woods, low tree branches and isolated stumps, may interfere with the throwing of grenades. It is necessary to find clear spaces where the grenades may be employed and to mark those spots, by blazing, for example. In some directions branches and twigs may be trimmed or trees chopped down in order to have a clear space to permit the utilization of grenades. The men should take cover behind the trees in order to gain protection against the grenades of the enemy.

In towns, when throwing grenades through windows and doors, a position should be taken up which will protect the thrower against the possible rebound of the grenade from a wall. When throwing the grenade through narrow windows or doors, it is first necessary to select the spot on the floor whence the approaches to the buildings may be hit.

Next it is necessary to determine the distance at which the grenade should be thrown. Men must be trained how to find the range under poor visibility conditions up to 70 yards—to estimate the range properly within one yard, at twilight, at night, under artificial illumination (use of rockets, searchlights, fires). The ability to estimate properly the range in throwing the hand grenade will aid the men in the proper method of throwing and in the precise muscular effort required for the same. Students must be thoroughly trained in grenade throwing at distances of 20 to 70 yards on level ground.

Hand grenade throwing. In certain instances, all six methods of grenade throwing may be employed: (1) From behind a wall, overhead; (2) With right hand, underhand; (3) With right hand, side-throw; (4) From kneeling position, on right knee; (5) From kneeling position, on both knees, and (6) From prone position.

The method to be used must meet the particular requirements of the situation. Let us present a few examples. From behind bushes, when visibility is poor, it will usually be necessary to throw the hand grenade at a high angle. When throwing the grenade in a woods, with low-hanging branches, it will be necessary, on the other hand, to throw it close to the ground. When throwing the grenade against hostile trenches, it must be thrown at a very high angle, in order to make it practically impossible for the enemy to hurl the grenade back—the grenades coming down upon him practically vertically.

Under poor visibility conditions, where the hostile fire will not be such as to preclude this, grenades should be thrown from the standing position, which is the most favorable position for it. Ordinarily, however, positions and methods will have to be adopted with due regard for the particular condition and nature of the trenches.

Thus, the nature of the cover, the position of the soldier, and the method of throwing the grenade will be mutually dependent upon one another. Men must be taught to perform all of the preliminary functions as swiftly as possible, at a moment's notice in some cases.

The most important factor involved is the actual throwing of the grenade. Grenade throwing should form part of the regular training of the soldier and should be included along with other subjects, such as the use of entrenching tools, proper concealment, camouflage, rifle and machine-gun fire. Men must be taught how to select the most favorable *tactical* moment for the use of the grenades. One reason for this is the fact that only two grenades are carried per man, and it is a rather difficult matter to obtain an additional supply of grenades in the heat of the battle.

Training in the use of hand grenades should include methods of defense against hostile grenades. Proper concealment, observation and well-aimed fire against hostile grenadiers are among the basic matters here involved. However, in the case where the opponents come within a score of meters from one another, no concealment or camouflage will suffice to hide a trench from the enemy. It will be readily disclosed by the discharge of weapons, by the nature of its position and numerous other indications.

We may recall, in this connection, one of the methods used during the World War against hostile grenades.

Trenches were covered with a metal (steel) screen that was capable of retaining even the smallest grenade dropped upon it. This screen did not interfere with the use of rifle and machine-gun fire. When a grenade hit the screen it either bounced off or was knocked off by a specially detailed soldier in the trench with his hand or rifle butt.

We have at our disposal at the present time everything needed for a study of the hand grenade and of the methods of its employment, and for acquiring a practical knowledge of the potentialities of this remarkable "pocket artillery."

THE EMPLOYMENT OF AND COMBAT AGAINST MODERN TANKS*

["Verwendung und Bekämpfung neuzeitlicher Panzerkampfwagen." By Major Volckheim. Condensed from *Die Panzertruppe,* March 1939.]

By Captain H. D. Kehm, *Field Artillery*

From the clumsy tank of the World War which had to make its own way through the open country slowly and with great difficulty, which was lightly armored and had many technical shortcomings (poor observation, great heat, and difficult communication), there has been produced, through years of development, a modern tank "the principal offensive weapon of ground warfare," which fulfills all the requirements which must be imposed upon a tank of today. From the tank which was designed as an accompanying weapon for the infantry, to roll out and prepare a path for it through strong obstacles, there has developed the modern armored

*This article gives a general conception of tank and antitank combat. Considered in connection with the studies of Russian and French doctrines, translated in the March 1939 (Vol. XIX, No. 72, pp. 68 and 73) and the June 1939 (Vol. XIX, No. 73, pp. 46 and 50) issues of The Command and General Staff School Military Review.

vehicle which though still suited for direct support of the infantry, on account of its great speed and high degree of mobility, is also suited to employment in independent armored forces.

During the War, antitank weapons were developed and employed at the front for use in a very limited number of situations as a specialized weapon: on the part of our erstwhile enemy, because German tanks did not appear until 1918 and then only in small numbers; on our side, because we underestimated the significance of tanks for too long a time. The development of modern tank masses forced a greater attention upon antitank defense. Since the tank has become the decisive weapon, a modern and powerful defense against it had to be provided. Today, therefore, the tank finds itself opposed by modern antitank weapons (antitank cannon and super-heavy machine guns).

Modern armies can no more do without antitank units than they can without tank organizations. Together they create a strong weapon-partnership, i.e., the armored troops, just as aviators and antitaircraft troops do in the case of the air forces. Tanks and antitank weapons are both called upon to aid the other arms, especially the infantry, in attack and in defense, particularly at the decisive points.

Tactics of Armored Forces

1. *Characteristics of Modern Tanks*

Tanks are an offensive arm that fight while in motion. They combine great offensive power, under protective armor, with speed and cross-country mobility.

Based upon armament, armor, and equipment, differentiation is made between heavy, medium, light, and specialized tanks. Based on their assigned missions they may be employed (as in France and Russia, for example) as accompanying tanks (infantry-accompanying tanks) or as tanks in the hands of the force commander (tanks for long-range operations).

Heavy tanks are breakthrough weapons which are employed against especially strongly organized positions to prepare the way for a deep penetration into the hostile position by other tanks and troops by crushing or pushing over obstacles and neutralizing all hostile weapons. Their characteristics are: very heavy armament (several guns of calibers from 75 to 155-mm and as many as 8 machine guns) heavy armor (1¾ to 2½ in.) which afford protection against all antitank guns (the French heavy tank is apparently protected against the shells of field guns). Their slow speed and limited range—resulting from the weight (up to 98 tons) of the vehicle—serve to restrict their employment.

Medium tanks are the real offensive armored vehicles, which above all are suited for attacking and destroying antitank weapons. They are expected to support light tanks especially against antitank guns and hostile tanks in order to assist the latter in accomplishing their support of the infantry. After neutralizing antitank weapons they automatically go into action against enemy machine guns. Their characteristics are: armor-piercing weapons (cannon and super-heavy machine guns) and several machine guns, high speed (25 mph or more), high cross-country mobility. The armor protects against small-arms fire, and, depending upon the range, against the fire of antitank weapons.

While the armament of heavy tanks requires that they be, as a rule, given special missions, light and medium tanks can, in general, accomplish similar tasks.

Primarily the task of the light tanks is to further advance of the infantry (riflemen) by subduing hostile machine guns. Their (light tanks) armament usually consists of two weapons (two machine guns or an armor-piercing gun and a machine gun). As in the case of the heavy and medium tanks, the guns are mounted in a movable turret, often coupled together so that one man may serve both. The armor plate generally gives protection against small-arms fire. Their speed runs about 31 mph.

Small tanks (formerly called "tankettes") generally serve on reconnaissance and security missions for armored units.

Special tanks are primarily employed for the support of other tanks in overcoming obstacles, for command purposes, and for accomplishing measures taken to secure concealment. Among foreign armies they are still in the development stage and therefore, are employed only to a limited extent. Nevertheless they are indispensable aids in accomplishing the particular tasks for which they are developed.

Thus, communication tanks are employed for communication and command within the armored-car forces and between them and the superior or neighboring commands (artillery, infantry). They carry sending and receiving sets for voice and telegraph radio and are armed only for self protection. Their cross-country mobility is similar to that of other tanks.

Engineer tanks are designed to facilitate the passage of water courses and ditches by other tanks, to destroy mine fields, and to lay mine barriers. Bridgelayers can, for example, with the help of crane equipment, throw bridges over fairly wide obstacles under the protection of armor plate.

Amphibious tanks can cross streams of considerable depth (water speeds are at present as high as 10 mph). In river crossing operations they are expected to facilitate the establishment of bridgeheads. On the ground they fight like light tanks.

Smoke tanks are able to establish large smoke screens to conceal (friendly) or to blind (hostile) tank attacks. They are to be employed primarily to facilitate the withdrawal from action of armored and other troops. Some of these tanks are also equipped to disseminate gas.

Flame-thrower tanks are expected to be employed at short ranges against living targets under cover.

Transport tanks are employed to bring riflemen forward behind tank forces under hostile fire, to make possible a rapid exploitation of a successful tank attack, as well as to bring up the essential supplies (especially ammunition) for tank forces and the most advanced elements of the infantry.

Modern tanks have complete cross-country mobility. The negotiation of difficult terrain requires the employment of special means as is the case with all other arms. Heavy tanks can climb over heights up to 5½ feet and can negotiate slopes up to about 45°; stones, tree-trunks, and low walls and elevations are generally traversed without any difficulty, ordinarily, by pushing them aside. For example, the heavy tank can push over a 30-inch tree and a light tank one of 12 inches. As a rule, tanks can cross any soft ground that men

and animals can traverse. The ability of a tank to cross ditches depends upon the overall length of the vehicle, and can be increased by the use of such devices as rollers and rails. Usually, water to a depth of 5 feet can be forded; this depth may be increased by laying facines, stones, etc., in the water. The radius of action (dependent upon the power of the motor, the weight of the tank, terrain and fuel capacity) is from 35 to 62 miles for the heavy, 75 to 135 miles for the medium, and from 62 to 195 miles for the light tank. Travel on favorable roads and terrain increases it while unfavorable terrain with slopes and obstacles serves to decrease it. Tanks are usually track-laying vehicles with combined track and wheel equipment so that they may be run either on wheels (on roads) or on tracks (cross-country) as desired.

The weapons are generally built into revolving turrets to permit operations in all directions. In medium and heavy tanks additional weapons are mounted in ports, some of them for employment against aircraft. The machine guns are to be employed against targets in the open, guns against those under cover, and the armor-piercing weapons against all those protected by armor. The effectiveness of the fire from modern tanks, even when they are in motion, is high, and is materially increased by intensive training.

The ammunition carried is as high as 400 rounds per machine gun and, depending on the caliber, from 200 to 400 rounds per cannon (including armor-piercing, high-explosive, and smoke shells). In addition to the driver there is a gunner for each weapon (in the larger tanks there is also a commander and a radio operator). Synchronized weapons may be served by one man.

For communication within the armored forces and with other units that are taking part in the attack, command tanks are usually provided with the latest signal equipment. Flag and light signals are valuable. Speaking tubes and light signals permit communication within the larger tanks; touch signals are employed in the smaller ones. Observation equipment consists of slots protected by bullet-proof glass and optical devices, which, it is true, limit the field of view in certain circumstances but nevertheless provide extensive observation.

Modern tanks can carry smoke apparatus in order to conceal themselves from antitank guns. Tanks are not very vulnerable to gas. Because the wearing of gas masks limits vision and, therefore the fighting ability of the crew, modern tanks are frequently gas-proof.

2. *Organization and tasks of tank units*

In foreign armies tanks are generally employed in greater numbers with surprise effect in the main effort to gain the decision. Numerous waves, each disposed in depth, follow each other. This employment is contemplated in joint action with the infantry and in independent action supported by motorized auxiliary troops. For this reason armored troops are, in foreign armies, organized into regiments and brigades in mechanized or fast (armored) divisions.

In most countries the various kinds of tanks (light, medium, heavy) are found both in separate and in mixed units. Depending upon the purpose for which they are to be used the light or the medium tanks predominate. The heavy tanks are formed into special units.

The smallest fighting unit is the platoon consisting, in the case of the heavy and medium companies, of from one to four tanks; in the light tanks, from five to seven. The platoon is not subdivided. Three to four platoons constitute a company; three to four companies a battalion; two to three battalions a regiment, and several regiments form the armored brigade.

In France, tanks, in time of peace, are organized into regiments with two or three battalions of three companies, each having about sixteen tanks. In addition there are separate light battalions and companies (designed for use in the colonies) and a heavy regiment. Staff and service companies are a part of the battalions and regiments. Brigade staffs have been organized for combined operations of large tank masses. In France tank troops belong to the infantry. A considerable increase in the number of tank units is contemplated in time of war.

The bulk of the British tanks is included in the armored brigade which belongs to the rapid division. This division has 330 tanks, the nucleus of the organization, 4 battalions of motorized riflemen, 3 mechanized batteries, and the necessary auxiliaries. The assignment of reconnaissance units is made from time to time in accordance with the requirements of the situation. The establishment of more tank brigades is contemplated in the present program of development of the army.

In Russia there is a tank regiment in each of the twenty-three army corps; in addition, other regiments are available to the higher commands. Besides these there are mechanized units, whose principle weapon is the tank. Their artillery is on self-propelled mounts, and the infantry and auxiliary troops are transported in trucks.

In the program for building up the army the Germans are developing a strong armored vehicle branch. German tank troops are assembled in brigades which are organized into regiments and battalions.

In foreign armies a distinction is made between infantry accompanying tanks and tanks designed for long-range operations (called tanks in the hands of the force commander). The mission of the former is the direct support of the infantry; of the latter, breaking into the hostile rear areas, primarily to neutralize the hostile artillery. In the French and in the Russian regulations it is stated that the infantry must carry the main load in battle and decides the outcome through close cooperation with the artillery and the armored units. "Protected and accompanied by its own fire and that of the artillery; depending upon the situation, following behind, or even preceding tanks, the infantry seizes and occupies terrain; prepares it for defense; and holds it." (French Regulations.)

According to the French conception tanks can accomplish the following missions: Accompany the infantry in battle and fight in close cooperation with it; in so doing they attack the automatic weapons which are hindering the advance of the infantry; (for the tanks in the hands of the force commander) precede the infantry at great distances and guide the accompanying tanks to next target; attack hostile armored units; penetrate deep into the hostile position as soon as it appears to be disorganized and drive through to the most rearward weapons and to the headquarters.

Russian regulations state, concerning the characteristics and missions of mechanized units, that they are capable of accomplishing tasks acting independently or in conjunction with other branches. They possess great mobility, strong fire power, and shock action. The basic form of combat of the mechanized forces is the tank attack supported by scheduled artillery fires.

French regulations visualize the following employment for armored and mechanized forces. When there is no longer an effective hostile resistance, and exploitation of the success seems possible, tanks can be made the nuclei of mixed mechanized battalions which are made up, for the most part, of the armored vehicles from all kinds of units (motorized reconnaissance battalions, motorized brigades of cavalry divisions, or at times even light mechanized divisions).

From this basis it follows that it is the task of the tanks to gain the decision by a coordinated, overwhelming attack at the point which is most vital to the command as a whole.

3. *Methods of Combat*

Tanks attack directly from the march or after a preliminary preparation. Preparations for the attack must bear in mind the need for gaining surprise. This requires rapid and concealed approach marches and development (generally under the cover of darkness), careful regulation of traffic, provision for supply, and reliable communications for command.

Whereas it was necessary during the World War, because of the low speeds, technical short-comings of the vehicles, and the difficulties of command and communication, to go into a "waiting position"* and then into an "assault position" (the latter behind the most advanced lines) before making an attack; these may now be dispensed with. At present one advances to the attack directly from a preparatory position area.†

The amount of reconnaissance is determined by the time available and must, when necessary, be very limited. Hence accurate maps are of special importance for tank troops. Routes to the preparatory positions, the unit areas in the preparatory position, and the terrain over which the deployed advance is to proceed are located and reconnoitered. A view of the terrain, from a ground observation post or from an airplane, over which the attack is to take place is important for the commander. It forms the basis for the scheme of maneuver. The nature of the terrain is the principle factor in determining the direction of the attack of armored units. In order to insure a rapid penetration into the battle position, it is much better to employ them on terrain which permits a rapid advance than to force them into unfavorable terrain just to have the tank attack move evenly with that of the other arms. On the other hand, the choice of unfavorable terrain is justified when scheduled fire support from the artillery and the heavy infantry weapons will be simpler and the amount of antitank resistance therefore decreases.

The preparatory position must be readily accessible; the existence of good roads facilitates this, especially at night. Concealment must be possible, especially if the delay in the area is to be long or is to extend into daylight. Behind our own lines the routes of approach and the areas for the subordinate units are definitely determined and marked. Guides and road markers must not be spared if the march is to be made without lights. In the preparatory position final preparations for the attack are made. They consist of refueling, rationing the troops, and when necessary, replenishing ammunition. Above all, however, detailed reconnaissance is carried out and communication is established with the other arms that are to take part in the attack. In preparatory positions near the enemy every precaution must be taken to insure a coordinated jump-off to the attack. When necessary, engineer troops must be made available to remove obstacles or to lay down gas.

In these preparations must also be included the necessary coordination with the troops cooperating in the attack.

A deployed advance to the attack is made from the preparatory position. The units take the formation both in width and in depth which is prescribed for the battle. However, those formations (e.g., line) are retained which are best adapted for a rapid advance, especially for the utilization of available roads, passage of defiles, and passage of our own infantry. In difficult terrain with poor visibility, a short halt may be necessary behind the last cover in order to insure a coordinated assault on the enemy.

The hour of the attack is determined by the situation, i.e., after preparations for the attack are completed and coordination with the other arms has been assured.

Measures for deception (e.g., a feint at another point) divert the attention of the enemy from the front on which the attack is to be made.

All movements of tank units under hostile observation are made at the greatest possible speeds and with the utilization of all available cover. In this way a coordinated assault on a wide front and in a deep formation is attained. Every tank unit presses on its objective, utilizing its speed to the extent that the hostile resistance permits. In doing so it will be necessary to halt briefly, in order to neutralize most important hostile weapons with carefully aimed fire, and then to dash forward at full speed to a new firing position. Fire and movement must be combined.

Inasmuch as the enemy will have emplaced the mass of his antitank weapons where, based on the nature of the terrain and information available to him, he expects the tank attack, strong antitank resistance must be expected in every situation. The situation will be clarified and hostile fire uncovered by tanks sent well out in advance. Because the tanks are to support the infantry it is absolutely necessary that the mass of the antitank guns be neutralized by these advanced tank waves, so that it will be possible for the units which follow to put out of action the hostile weapons which hinder the advance of the infantry—the machine guns. Hence, the various phases of the tank fight develop into a duel between tanks and antitank weapons. Skillful use of the terrain, avoiding a perpendicular approach, and the support of the weapons of heavier tanks, which can operate effectively at greater ranges, bring success. The greater the number of successive waves of tanks, the greater will be

*Corresponds to our "Intermediate position." (Translator's note.)

†What is translated as "preparatory position" corresponds most nearly to what are called "points of deployment" in our service. It will be seen later that the "preparatory position" is used for many of the operations which are carried out in our "assault positions." It is for this reason that the new term is used. (Translator's Note.)

the effect upon the antitank guns and hence the greater will be the assistance to the infantry, which can use the moral and objective effectiveness of the tanks to press ahead. From this it follows that it is the employment of tanks in masses, attacking in the required width and, most important of all, in great depth, which will insure the advance of the infantry and a substantial penetration of the hostile line under armored protection.

That is how a tank attack should be carried out. Established firing ability of all arms and unremitting alertness in the tanks will result in effective prosecution of the attack within effective ranges and will produce a great moral effect, but above all, a real conquest of arms. As already mentioned, the enemy must not only be overrun, with the greatest speed, but he must be neutralized and destroyed. This requires that after the crews have been neutralized the guns themselves must be destroyed by running over them.

In order to carry out this systematic firefight effectively, established forms of attack, permitting the most effective use of all weapons, must be employed. The platoons therefore advance in line or in wedge formation (echeloned in depth) with the intervals found most effective in German tank attacks during the World War from 50 to 100 yards.

For the attack, companies are formed into several waves. According to British doctrines, medium tanks, armed with guns, are attached to them, in order to provide the necessary protection against antitank weapons. Each tank unit provides for reconnaissance to its front, and where applicable to the flank exactly as is the practise in other arms. For the attack, battalions are disposed in line, whereas regiments dispose their battalions, and brigades their regiments, either in column or in line.

It goes without saying that all commanders are well forward in order to observe the action of their units and to make their personal influence effective.

The form of the hostile antitank defense and the requirements for supporting the attack of the infantry determine the task of the individual waves. The advanced waves are assigned objectives in front of those of succeeding waves. The leading wave, therefore, necessarily acquires the task of destroying hostile antitank weapons.

It is necessary to assign tank units their objectives before the attack begins. So that the general direction of the attack as a whole may be maintained, it is necessary to indicate reference points to the commanders of units on the ground. In terrain where visibility is poor, and above all in fog and in darkness, direction is maintained by using radio and visual signals. Radio silence must be preserved until the hostile position is penetrated; until that time visual and other means must be employed for command purposes. In the fight, command liaison is by radio, because there is no longer any need for concealment, and because the rapidity of the action insures that intercepted messages will be of no help to the enemy.

The front of the attack depends upon the number of units engaged, and should be at least 2200 yards; the depth is dependent upon the number of waves employed.

After the objectives of the attack are reached, orders for the future employment of the armored units are issued. This must follow quickly because at this point the armored units may be required to widen the penetration by rolling up the flanks, to pursue, or to resume a partially successful attack by engaging against hostile reserves which have been brought up. After a lengthy engagement over considerable distance it is generally necessary to replace ammunition, losses in personnel and vehicles, and, depending upon the losses, to reorganize. Assembly points for such purposes can generally be designated only during the battle. The assembly must take place under cover against hostile aerial observation and direct fire, and must permit rapid deployment and engagement in the required directions.

4. *Joint Action Between Tanks and the Other Arms*

Prerequisites for successful cooperation are mutual understanding of the methods of combat, which depend on the characteristics of the weapons, of the arms involved; determination to support the other arm to the greatest extent possible; and actual practice in joint action, which must be had in time of peace. It is further necessary that the coordination required for mutual support be effected before the beginning of the attack.

The question of joint action is the most significant and the most highly debated. On one side is the requirement that tanks be tied closely to the infantry, i.e., that they be split up into the smallest units and regulate their speed on that of the infantry. On the other side is the demand that the tanks be organized into large masses and employed independently on the hostile flanks and rear, in order thereby to decide the battle, or even the war, quickly. In the present state of technical developments, the latter is a dream for the future and the former unsound. For if the tanks split up among infantry units their effectiveness is divided. Even in the other arms one builds up a concentration at the point where the decision is sought and masses the available means in unified control. If tanks are tied to the tempo of the infantry, they are robbed of their mobility, the prospects for success are decreased, they are offered as prizes to the hostile antitank defense.

At the point where the decision is to be sought by the use of tanks, they are the principal weapon; all others must regulate on them to attain the common success. This applies to the selection of the terrain over which the attack is to be made, the timing of the attack, and also the manner in which the infantry and the artillery are to be employed. Today this conception is accepted in foreign armies, even when emphasis is laid on the fact that the infantry bears the main load in battle, or that the infantry in close cooperation with artillery and tanks decides the outcome of the battle. In T.F. I (No. 340, 339) it is stated: "The commander brings the fighting ability of the tanks and the cooperation of the other arms into harmony. In the area in which the tank combat takes place the other arms must regulate their action on that of the tanks" and, "The deciding factor (as to the direction of the attack) is the terrain. Remaining too close the infantry robs tanks of their speed and in certain circumstances allows them to become a victim of hostile defense."

There are three cases in joint action with the infantry:

(1) The tanks attack before the infantry to reduce the infantry's losses and to facilitate its advance when there is a wide stretch of open ground which must be crossed

before contact with the enemy is gained. The infantry follows as rapidly as possible in order to exploit the paralyzing effect of the tanks. In this case it is especially important that the tanks be supported by heavy artillery and machine-gun fire on known or suspected antitank weapons.

(2) The tanks attack simultaneously with the infantry. This case arises when the terrain is readily crossed and the distance to the enemy is not great, and hence a simultaneous attack by tanks and infantry is possible. This plan seems the most favorable.

(3) The tanks atack after the infantry when terrain obstacles, e.g., streams or mine barriers, delay the advance of tanks until crossings are prepared or gas is employed. In such cases the infantry must be heavily supported by artillery and engineers.

Terrain is always the factor which determines the direction of the tank attack. That direction need not coincide with that of the infantry advance. Only the objective need be the same.

It is obvious that the infantry must employ all means to lighten the heavy task of the tanks by neutralizing antitank weapons. To this end there must be uninterrupted observation before and during the attack and the utilization of the heavy weapons so that located antitank weapons may be quickly overwhelmed by fire, so that the tanks may be informed of targets that may become dangerous to them, and of targets and obstacles which must be overcome to insure the advance of the infantry.

The infantry must constantly struggle to exploit tank successes by rapid advances. It must understand that tanks cannot neutralize absolutely all hostile weapons; it must not wait for that but must also do some fighting by itself.

Cooperation with the artillery: Because of the rapidity of the development of an attack, protection by a rolling barrage, as employed in the War, is no longer practicable. Hence the primary task of the division artillery is to support the preparations for the attack by fires upon known hostile antitank weapons and artillery and by blinding observation posts with smoke.

When the tank attack begins the artillery fire will generally have to be lifted from the zone of the attack, in order not to restrict the tank action. Thus it may be appropriate to protect the flanks or to neutralize and to destroy such targets as the tanks cannot, or are not supposed to, attack, e.g., towns, woods, steep slopes, probable positions of antitank weapons.

If there is not sufficient artillery in the area of the attack and if bringing it in will jeopardize surprise, the artillery preparation must be foregone. In this case it is the mission of the artillery to observe the progress of the tank attack and to take under fire any antitank guns that appear. The observed artillery fire support does not extend far, and because of the rapid progress of the attack, is not of long duration. Therefore, it follows that only motorized artillery is in a position to support a moving tank attack, since it can follow up quickly. Most valuable are self-propelled mounts, which are permanently ready to fire. They are therefore sought for tank organizations and have already been introduced to a limited extent in foreign armies.

Cooperation with engineers: When the terrain renders such assistance imperative, the employment of engineers in support of a tank attack is as necessary in the preparation as it is during the attack. Frequently organic engineers will suffice for making the smooth progress of the tanks possible by removing obstacles and preparing crossings. Frequently however, skilled, independent units of engineers and their means will be required, most especially, for crossing large streams and ditches. The engineers play a decisive role in the attack when, in cooperation with the infantry, they have the task of securing an obstacle and rendering it passable as quickly as possible for the tanks which follow them.

Special training is required for recognizing and destroying mine barriers, which are a dangerous impediment to tanks. In just such situations motorized engineers can perform important service by facilitating the advance of the tanks in the face of such barriers.

Cooperation with aircraft: Aircraft can assist the tank attack effectively by reconnaissance and by combat, during the battle. This was demonstrated in the World War when British planes (8 August 1918) attacked German batteries, reserves, and columns with bombs and machine guns. This is even more significant today for the reason that it must be expected that tanks, motorized antitank weapons, and reserves will always be brought up to take part in the tank battle.

Aircraft are capable of maintaining liaison between tank units and the higher commanders, as well as rapidly disseminating to tanks information of hostile reserves, obtained during their reconnaissance activities.

Finally, the employment of aircraft comes into consideration in meeting a hostile air attack on tank units. Furthermore, tanks are especially suited to exploit a successful air attack.

5. *The Battle of Tank vs. Tank*

In launching a tank against an enemy who is known to have strong tank forces available, consideration must always be given to the possibility of a "tank vs. tank battle." According to French and Russian views, in the defense, it is the task of the tanks to beat off a hostile tank attack. If the tank vs. tank fight was an accident in the World War, it must be expected to occur frequently in the future.

One must consider three possibilities for encounters between hostile tanks. In one case the tanks meet unexpectedly, hence, assuming similar tanks, the chances for success are equal for each. In the second case our own tanks are employed to defeat a hostile tank attack. They will have an advantage. In the third case our tanks are struck by hostile tanks while they are attacking, in this case superiority must be fought for.

It is obvious that wherever hostile tanks appear on the battlefield to oppose our own they are the most dangerous enemy and must therefore be most vigorously engaged. It is hence necessary to defeat this enemy in order to be able to carry out the basic mission. In any event one must strive to advance toward the enemy to overwhelm him with surprise fire from a halted firing position. In the progress of this battle and when fire surprise is not possible, it may be necessary to take up a running fight. Good visibility and favorable terrain are important prerequisites for success in such a case. Of decisive importance are discipline within the units, determined leadership, and rigid fire control, as well

as insuring superiority by employing the reserves where the enemy is weakest. The fire fight alone can win the battle, and in it the greatest possible number of hostile tanks will be destroyed. The previously mentioned war experiences are conclusive. Proper use of the terrain can reduce losses and also make it possible to close up on the enemy to favorable ranges so that well aimed fire may then be employed to defeat him.

The battle against tanks is not decided until the hostile tanks are destroyed. Only then is the danger removed and the possibility of accomplishing the basic mission insured.

[Editor's note: The foregoing extract covers tank tactics only.]

"If time be, as is everywhere admitted, a supreme factor in war, it behooves countries whose genius is essentially not military, whose people, like all free people, object to paying for large military establishments, to see to it that they are at least strong enough to gain the time necessary to turn the spirit and capacity of their subjects into the new activities which war calls for.—MAHAN."

(From *The Army Quarterly*, July 1939.)

Book Reviews

By Major M. D. Barndollar, *Infantry*

INFANTRY IN BATTLE

422 pages . . . Washington, D.C.: Infantry Journal, Inc.

The Infantry Journal, Incorporated, has recently published a second edition of *Infantry in Battle* which is not merely a reprint but embodies many improved features. The book treats of the tactics of small units as illustrated by concrete examples drawn from the World War. These examples are drawn primarily from personal experience monographs of American army officers and include numerous recorded experiences of officers of the British and French as well as the German armies. These are accounts of men and officers who actually participated in these events.

Each of the twenty-seven chapters of the book is headed by a principle or doctrine which the chapter is purported to teach. After a short explanation and discussion of the principles involved, several personal experience examples are given (with sketches) designed to illustrate the correct or incorrect application of this principle. Each example is followed by a discussion to show that the success of the particular action could be attributed to the sound application of the tactical principle or, in those examples ending in failure, that the lack of success was attributable to failure to apply the principle. Each chapter is concluded by a discussion designed to emphasize the correct application of the tactical principle or doctrine involved.

The first edition of *Infantry in Battle* was prepared by the Military History and Publications section of The Infantry School under the direction of Brigadier General George C. Marshall and published in 1934. The new edition contains, with few exceptions, the same examples as the first edition but many of the discussions and conclusions have been revised to show more fully the application of the examples to present day teachings. An outstanding improvement in the new edition is found in the sketches which have been revised and made far more readable.

THE RISE OF AMERICAN NAVAL POWER

By Harold and Margaret Sprout

386 pages . . . Princeton, N.J.: Princeton University Press

Reviewed by Lieutenant J. W. Rudolph, Infantry

What George Fielding Eliot has done for the entire field of national defense, Harold and Margaret Sprout are doing for the U. S. Navy. A thorough, scholarly, and readable discussion of American naval history has been a need ever since Admiral Mahan propounded the modern theory of sea power, and that analysis may now be forthcoming. The present volume deals with the development of American naval power only to the close of the World War, but a sequel is now in preparation. If it maintains the excellent analytical and literary standards of this book, the coming volume may well complete one of the best authorities on the subject.

Despite the possession of thousands of miles of sea coast, despite the vital role the sea has played in American history, and in spite of the fact that an American naval officer was the world's foremost naval strategist, the United States has been woefully backward in appreciation of naval power. From the days of the Revolution, both government and public have failed to understand and profit by the sea's most elementary lessons.

In a dispassionate but critical analysis, the authors review the history of America's naval policy, pointing out the lessons of our wars, our inevitable failure to learn those lessons, and the consequences in unpreparedness. The confusion apparently was never helped much by the navy itself, for the naval officers were consistently the worst offenders.

With the advent of Mahan and the rise of Theodore Roosevelt, American naval policy took a great forward stride. It developed further under the pressure of the Great War until in 1919 the United States possessed the greatest instrument of naval power in the world, a possession that had much to do with our predominent political position. What we did with that power has been left for the sequel to tell.

POLAND: KEY TO EUROPE

By Raymond Leslie Buell

379 pages . . . New York: Alfred A. Knopf

What of Poland? What role will the Polish nation play in future European situations? How strong is Poland? To these ever recurring questions, Mr. Raymond L. Buell, President of the American Foreign Policy Association, in his recent book, *Poland: Key to Europe*, has given us timely and dispassionate information from which we may draw our conclusions.

As a background for the present-day attitude, characteristics and traits of the Polish peoples, Mr. Buell first enlightens us on early Polish history. The constant struggles throughout the years to gain and retain independence has left these peoples in a suspicious and distrustful frame of mind toward other nations. Contemporary Poland is discussed in relation to its economic and political systems, its problem of increasing population, its agricultural, and industrial dilemmas and finally its discontended minorities.

The present thorn in Poland's internal strife is its minorities. Of its total population of 34,500,000 only about 23,000,000 are Poles, the remainder being primarily Ukrainians (5,000,000), Jews (3,500,000) and Germans (750,000). Some of these minority groups are the natural breeding ground of internal dissension, whose loyalty in case of war would be extremely doubtful, according to Mr. Buell.

Poland's foreign policy is governed by history and geography. It occupies the most strategic and difficult position of any nation in Europe today. Flanked on the east by Russia, it has had a constant struggle to buffer the communist aggressions toward the west. It is now practically surrounded on three sides by the German Reich, which makes no secret that it regards Poland as an obstacle in its path to expansion toward the east.

Poland's solution to its internal difficulties and its attitude toward world affairs may well be the key to peace or war in Europe.

REMEMBER THE MAINE

By Gregory Mason

312 pages . . . New York: Henry Holt and Company

Remember The Maine might be classed as a cub reporter's eye-view of the Spanish-American War forty years after. In it Mr. Mason first arouses our recollections of the times by a discussion of the spirit then existing as reflected in the news of the daily papers, the songs we were singing, the restless spirit of the people and the financial and political conditions existing.

Then comes the sinking of the *Maine* (cause never proven) on 15 February, 1898, and the declaration of war on 21 April, 1898. From here on in *Remember The Maine*, Mr. Mason, largely from first hand knowledge, vividly describes our pursuit of victory over the Spaniards. He carries us to Manila Bay, where the aggressive methods employed by Admiral Dewey to obtain a complete victory over the Spanish Squadron should ever be a source of pride to the American Navy.

From the Philippines we jump to Cuba or rather to the preparation for the conquest of Cuba. From its inception to its completion, the expedition to Cuba was a "comedy of errors" according to Mr. Mason. Despite the amateurish preparation for the expedition, the half-hearted consummation of the service of supply, the ravages of tropical diseases and the blunders of our leaders, the conquest of Cuba and Puerto Rico proved a complete success, largely because of the lower morale of the Spanish Army and the greater blunders of its leaders. Our errors are largely attributed to the questionable ability of our leaders as exemplified in Generals Shafter and Wheeler and Colonel Theodore Roosevelt for the army, and Admiral Sampson for the navy. According to the author, many of the leaders were largely influenced by the desire for personal and political aggrandizement.

Although the book is not a treatise on military or naval operations, it does contain many lessons for the army or navy personnel. Certainly Mr. Mason's account of the preparation for and conduct of the conquest of Cuba might be embodied in a textbook on "How *Not* to Conduct a Joint-Overseas Expedition."

BOMBS BURSTING IN AIR

By Major George Fielding Eliot

173 pages . . . New York: Reynal and Hitchcock, Inc.

In *The Ramparts We Watch*, Major Eliot gave us a clear expose of the general principles upon which the security of our country depends. In *Bombs Bursting in Air*, he confines his discussion to the influence of air power on international relations in such a concise and accurate manner as to present a readily understandable picture of the present-day air situation.

In the first few chapters of the book a comparison of the present-day air strength of the various European nations is discussed, together with a presentation of the possible expansions to be expected in the immediate future. The influence of other elements, such as raw materials, geography and replacement ability, are interestingly weighed and discussed. As a final analysis, Major Eliot concludes that numerical strength in airplanes alone is no criterion of a nation's air power.

The author contends that "It is blackmail which rules Europe today, and nothing else; blackmail made possible only by the existence of air power." Admittedly, the superior air forces of Germany and Italy were a vital factor in the "Retreat of Munich." However, the hourly bombing of London, as Hitler is said to have threatened to do, would have been attended by many difficulties and subject to enormous losses to the German air force. Nor has the moral effect of air bombing upon the civilian population been definitely established. In this connection the bombing of Barcelona by 13 raids during a period of 41 hours is quoted as having the effect of destroying the whole mental life of a million and a half people for forty hours. Such a conclusion is undoubtedly accurate but fails to consider fully the other morale reducing factors under which the citizens of Barcelona had been living for many previous months. Major Eliot's conclusions as to the value of air forces in future wars are well taken in his words "Air power in the physical field remains a weapon of uncertain value and untried possibilities. In the psychological field it is dominant and all important."

Turning to the American situation, he first presents an analysis of the possibilities of air attacks on our shores. The possibilities of an air attack from any other North American nation or by a non-American nation flying directly across the ocean from its own bases are readily eliminated. The chances of air raids from floating bases except on a small scale are belittled so long as our navy remains intact. Our safety from air attack will remain only so long as we keep the whole Western Hemisphere and its approaches free of the air bases of possible foreign foes.

How much air power do we need? In debating this question Major Eliot presents with clarity the factors to be considered in arriving at a conservative basis for our air

strength, without attempting to recommend any definite numerical strength. The present proposed development program is descussed in relation to our future air needs.

OUR MAGINOT LINE
THE DEFENSE OF THE AMERICAS

By Livingston Hartley

315 pages . . . New York: Carrick & Evans

In *Our Maginot Line,* Mr. Livingston Hartley, a former official of the Department of State, presents a pessimistic, analytical discussion of present-day political conditions, with emphasis upon the part our nation fits into the picture. In the five parts into which the book is divided, he discusses in turn:

Germany: Its ambitions and possibilities of attainment.
America: Its position in world affairs and problems of security.
The Atlantic: Its strategical import to America.
The Pacific: Its strategical import to America.
Safer Navigation: America's reaction to the problems presented.

In discussing Germany's future course, Mr. Hartley is apparently convinced that the Reich will continue, with renewed efforts, to advance along "The Road to Weltmacht." Its possibilities for success presents a gloomy outlook to the non-totalitarian nations. Our country's security lies in the successful pursuit of the policy to retain "America for the Americans." Should the totalitarian states or Japan once gain a foothold in South America, the United States will be fighting with its back to the wall. From a strategical analysis of the two oceans touching our shores, the author, without belittling Japan's aggressions via the islands of the South Pacific, concludes that our greater dangers will approach from the Atlantic. This ocean must not become an area of intercontinental rivalry nor a future arena of an inter-continental clash. To prevent this, the United States must not only retain a superior ratio of naval strength but must bend its efforts to see that Germany does not succeed in controlling the European side of the ocean.

The book presents a most gloomy outlook of our immediate future security. It puts forth many possibilities of hostile encroachments upon our future liberties. The capabilities as presented are undoubtedly present but some of the clouds might be given a silver lining by a more acute analysis of our available means to combat these possible aggressions.

SECRET AGENT OF JAPAN

By Amleto Vespa

301 pages . . . Boston: Little, Brown & Co.

Secret Agent of Japan, if accepted as authentic experiences of the author and true recordings of his conversations with Japanese officials, should open the eyes of the western world to Japan's ambitions. That the Japanese people are imbued with the idea that they are God's chosen race, destined to rule the greatest empire on earth, the book leaves but little doubt in the reader's mind. The first phase of their contemplated conquests embodies the subjugation of Korea, Manchuria, Mongolia, China and Siberia as far as Irkutsk. Upon the consolidation of these peoples into the empire, the second phase will be instigated calling for the conquest of India, all of the Islands of the Pacific and Siberia as far as the Ural regions. Apparently the Japanese have no intention of imparting their culture or civilization to the peoples they conquer. They will subjugate them by a process of destruction and annihilation, the Koreans through vices, the Chinese through opium and other narcotics and the Russians through vodka. The book expresses the feelings of utter contempt which many Japanese officials feel toward other nationalities.

The author, Mr. Amleto Vespa, was born in Italy in 1888. After completing his education and military service in that country, he traveled over much of the world as a free-lance journalist and soldier of fortune. From 1916 until 1928, he was in the employ of the Chinese, much of that time acting as a secret agent for Marshal Chang Tso-lin, the Governor of Manchuria. After the occupation of Manchuria by the Japanese, Mr. Vespa was impressed into their secret service and forced to do their bidding through threats of harm to his family.

The book is a revelation of the author's personal experiences largely inspired by resentment of his treatment and revulsion of the inhuman methods allegedly employed by the Japanese.

WHEAT AND SOLDIERS

By Corporal Ashihei Hino

191 pages . . . New York: Farrar & Rinehart

Wheat and Soldiers is a Japanese infantry corporal's account of his experiences with the army in China. Corporal Ashihei Hino first touched Chinese soil during the landing operations at Hanchow Bay on November 15, 1937 and subsequently took part in the fighting which resulted in the Chinese evacuation of the Shanghai area. He vividly describes, out of a collection of letters to his home and reflections set down in his diary, the daily struggles for food, sleep and life itself. He shows the common Japanese soldier in all the physical tortures and emotional intensities of modern warfare.

The book reveals little as to the tactical methods employed by the Japanese. As expressed by Corporal Hino, little is known by the soldier in the ranks other than that he must march and fight—fight and march—grasping such intermittent sleep as becomes possible and eating when and if the foraging is successful. The human emotions of gnawing fear, the utter fatigue of constant marching on empty stomachs, the agonies of being surrounded by the enemy, the discomfortures of mud and filth are all set down as living experiences virtually as they occur.

Army officers will find this book not only interesting reading but a revealing insight to the psychology of the Japanese soldier in the present conflict in China.

Library Bulletin

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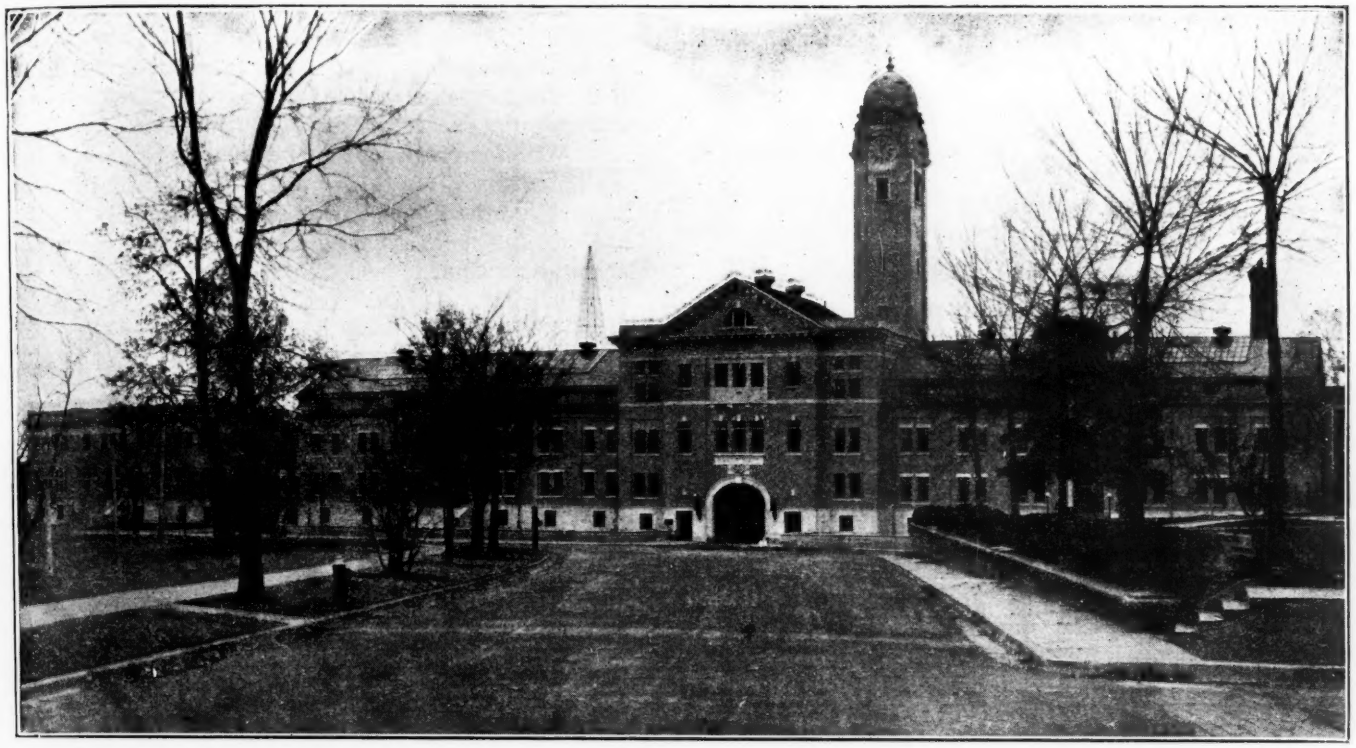
Pending the publication and issue of the new Field Service Regulations by the Government, The Command and General Staff School will print the regulations for instructional purposes.

Persons in the military service interested in securing copies of the regulations may write to the Book Department, Command and General Staff School, Fort Leavenworth, Kansas.



Academic Notes

Current School Material, Which Affects Instructional Procedure or Tactical Doctrines

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V. Miscellaneous.....LIEUT.COLONEL R.E. MCQUILLIN, Cavalry

The G-2 Section, Corps General Staff

Excerpts from a Coordinating Lecture before the Regular Class, Command and General Staff School, 1939.

BY LIEUTENANT COLONEL F. W. BOWLEY, F. A.

One of the most important and profitable phases of instruction in the Command and General Staff School is not listed in the schedule nor is it allocated hours in the summary of the program. That is the part of the course devoted to Contemplation. If we were to take time to meditate on all the instruction given under the division series and were we

to analyze the map problems and map exercises encountered in that period, and were we of that type of mentality that searches constantly to reduce knowledge to its fundamentals, casting away all the trimmings and the elaborations, we would probably arrive at a very compact statement of principles. We might find the following:

1. Get a correct grasp of the tactical situation as a whole.
2. Act according to the circumstances and the nature of the terrain.
3. Insure teamwork.
4. Develop fire superiority.
5. Employ simple and direct plans and methods.

Then if we tried a further boiling-down process, having in mind primarily the work of G-2, we might reduce all this to a single statement:

"A SOUND TACTICAL DECISION IS UNLIKELY *WITHOUT KNOWLEDGE OF THE ENEMY*." While we are engaged in the rendering or boiling-down process, let us briefly consider the basic principles of intelligence work as we learned them in the study of the division. We have taught certain methods and no doubt caused you to accept a few ideas. We have even introduced you to some blank forms. In the final analysis, we shall have achieved considerable if, after setting aside all matters of pure technique, you are thoroughly indoctrinated with these few simple principles:

1. Consider constantly every possible line of action open to the enemy.
2. Know the powers and limitations of your information-collecting agencies.
3. By specific missions, focus attention on securing the information that the commander *must* have.
4. Get the evaluated information to persons or units concerned in time for it to be of use.
5. *Look ahead.*
6. Be a slave to your job and *not* to your system.

We progress now into the consideration of the corps. In boosting our intelligence activities up to the corps, we are going to take with us everything that we learned and used in studying the division. We will find in the corps that the only difference is one of magnitude, coupled with the fact that we are a little more remote from front-line units. We will find that we have less interference by the enemy, but more interference by "visiting firemen." We will work with better facilities and in more comfortable surroundings. We will have more information-collecting agencies at our disposal, and consequently more information to obtain. We will find the responsibility greater, and also the tendency *not* to get the information to the troops that need it.

At once we are impressed by the fact that our corps is greater than the largest force that Robert E. Lee ever commanded at one time in the Army of Northern Virginia. We grasp immediately that our corps is interested in larger forces of the enemy than was our division. But paradoxically as the size of the enemy force increases so do his capabilities decrease. He is more restricted by time and space, by road nets for the movement of troops, by lines of communication for supply and evacuation, and the various other factors which affect large bodies. Our G-2 therefore has an increased interest in these factors. He must adapt his viewpoint to bigger things and he will find that his work bulges out of the field of tactics and overlaps into the field of strategy. By the same paradox, our own growth in size has imposed similar restrictions on us which affect any countermeasures we may contemplate. G-2 is confronted with the necessity for increased rapidity in his work in order to compensate for the reduced speed of movement of our larger bodies. With increased rapidity he must also retain accuracy, as the effect of his errors will be magnified. In spite of the fact that the job has grown in magnitude, *the securing of combat intelligence still remains the primary duty*, and all other duties continue to be subordinate to that task.

INTELLIGENCE SECTION, CORPS STAFF

1 Colonel, GSC—Asst C of S, G-2.
1 Major, GSC.
6 Captains, DOL.
4 1st Lieuts, DOL.
2 Mr Sgts—Chief Clerks.
1 St Sgt—Chief Clerk.
1 St Sgt—Draftsman, Topographic.
2 St Sgts—Stenographers and Clerks.
1 Sgt—Observer.
3 Corpls—Observers.
6 Pvts, 1st Cl—Stenographers and Clerks.
10 Pvts—Observers.
3 Pvts—Clerks and Typists.
1 Pvt—Clerk and Mimeograph Operator.
2 Pvts—Clerks & Draftsmen.
TOTAL: 12 Officers, 32 Enlisted.
(Requisite Number of Officers & NCOs for Interpreters & Translators.)

CHART NO. 1

PERSONNEL OF G-2 SECTION OF THE CORPS.—You will recognize Chart No. 1 as presenting the information contained in Paragraph 106 *c* of the textbook *Command and Staff Principles*. The personnel of the G-2 Section of the Corps General Staff consists of 12 officers and 32 enlisted men, *plus* the requisite number of officers and noncommissioned officers for us as interpreters and translators. This section is larger than all the rest of the Corps General Staff taken together, and larger than the entire General Staff of the Division. You will remember in the discussion of the G-2 Section of the division that we brought out that all G-2 activities from the War Department down to the battalion have operating responsibilities in addition to the functional duties of a staff section. Here in the corps we have an operating agency in the form of four noncommissioned officers and ten privates, all trained observers.

In considering this set-up it should be borne in mind that these figures are for the G-2 Section of the corps *that is part of an army*. It is probable that the staff of any corps that is called upon to operate independently will be reinforced, for there will be extra demands made upon it. Such reinforcement might well come from the Army Staff, from the personnel of our own corps, or from some other convenient source, the number of reinforcements being dependent upon the situation.

ASSIGNMENT OF PERSONNEL
G-2 SECTION, CORPS

CHIEF OF SECTION, COLONEL, GSC.

SUB-SECTION A—ADMINISTRATION.

1 Capt—Chief of Sub-Section.
1 1st Lt—Charge of Message Room.

1 Mr Sgt—Chief Clerk.
1 St Sgt—Stenographer.
1 Pvt 1st Cl—Stenographer.
1 Pvt—Mimeograph Operator.

SUB-SECTION B—INTELLIGENCE.

1 Maj, GSC—Chief of Sub-Section.

GROUP 1.

1 Capt.
1 St Sgt—Chief Clerk.
1 Pt 1st Cl—Stenographer.
1 Pvt—Draftsman.

GROUP 2.

1 Capt.
1 1st Lt.
1 1st Lt—Charge of Observers.
1 Mr Sgt—Chief Clerk.
1 St Sgt—Draftsman.
1 Sgt—Observer.
3 Corpls—Observers.
1 Pvt 1st Cl—Stenographer.
1 Pvt—Draftsman.
3 Pvts—Typists.
10 Pvts—Observers.

GROUP 3.

1 Capt.
1 St Sgt—Stenographer.
1 Pvt 1st Cl—Stenographer.
(Requisite Number Officers & NCOs for Interpreters & Translators.)

SUB-SECTION C—PUBLIC RELATIONS.

1 Capt—Chief of Sub-Section.
1 1st Lt.
(3 Capts—Aides.)
1 Pvt 1st Cl—Stenographer.

SUB-SECTION D—SECRET SERVICE.

1 Capt—Chief of Sub-Section.
1 Pvt 1st Cl—Stenographer.

CHART NO. 2

ORGANIZATION OF SECTION.—Chart No. 2 is a reproduction of Paragraph 107 *c* of the text *Command and Staff Principles*. In the organization of the Corps G-2 Section, the mass of work has been broken down into sub-sections, one each for Administration, Intelligence, Public Relations and Secret Service. The production of Military Intelligence being the primary duty of the Section, the Intelligence Sub-Section is by far the largest. It in turn, because of the nature of its duties, requires further sub-division into groups, three in number. Unless G-2 remembers at all times that results only count, he may become submerged in the system which this dangerously-large office force represents.

DUTIES WITHIN G-2 SECTION

SUB-SECTION A.

Office Files.
Journal.
Mimeographing & Reproducing.
Personnel.
Training Policies.
Message Room.
Receipt & Dispatch of Intelligence Documents.

SUB-SECTION B, GROUP 1.

Plans.
Annexes.

SUB-SECTION B, GROUP 2.

Enemy: Order of Battle, Reserves, Activities, Movements, Artillery, AA Defense, Organization and Tactics, Armament, Ground Organization, Supply.
Terrain: Interpretation of Aerial Photographs, Maps.
Operation of OPs.

SUB-SECTION B, GROUP 3.

Prisoners.
Enemy Casualties.
Documents.
Translations.
Enemy Knowledge of our Situation.

SUB-SECTION C.

Censorship.
Press Correspondents.
Visitors & Foreign Missions.

SUB-SECTION D.

Counter-Espionage.
Plans for Preventing Activities of Enemy Agents.

CHART NO. 3

DUTIES.—Going on to the consideration of the duties of the Section, we find them enumerated in Paragraph 27 and allocated to sub-section in Paragraph 107 *c* of the text *Command and Staff Principles* and reproduced on Chart No. 3. The duties of the G-2 Section are complex and the personnel who are to carry them out must have more than the average military background. In tactical doctrine alone, the members of the G-2 Section not only have to be trained according to our own ideas but also they must have an extensive knowledge of the tactical doctrine of the enemy. The great expansion which comes on M Day is bound to spread the trained personnel of the Regular Army in a thin layer and a very thin one at that. It is highly probable that in a hastily thrown together Corps Staff we would be fortunate indeed if G-2 himself had had the experience to fit him for his duties. Under our peacetime set-up there is little other than this school which provides trained officers for this work. Duty in any of our Corps Area Headquarters does not develop combat intelligence experts because of the demands of other duties. Our experience with combat intelligence from a corps viewpoint is limited to such few maneuvers as appear in the four Army commands. It is quite apparent that the results of our recent maneuvers have not been entirely satisfactory, and the bulk of the blame has been laid at the door of G-2. The reports of commanders and umpires frequently comment on the weakness of Combat Intelligence, with the result that we may expect the stressing of Intelligence training. It is reasonable to suppose that upon their return to troops, graduates of this School will be expected to know how to fill the role of a division or Corps G-2 in maneuvers or command post exercises, and to instruct others who have not been as fortunate in their schooling.

In reading the text *Command and Staff Principles* on the organization of the Corps G-2 Office, it should be remembered that it is not a prescribed set-up, but is a type organization adopted by the Command and General Staff School for instructional purposes. It is to serve as a guide only, and the School offers it as *a* solution and not as *the approved* solution. And we take exactly the same attitude toward the technique of intelligence work as we teach it here. Our technique, our blank forms and our system constitute our solution and we are not the least hide-bound about it. It is quite possible to devise a system or forms that will produce the results desired in a more expeditious manner. But we do believe that the bare-bone principles which we enunciate are sound and will stand up under the wear and tear of field service.

In our opening remarks the statement was made that the corps had more information-collecting agencies than

the division. Let us scrutinize that statement and see just what these agenices are. In our School texts there are two references from which we may get the details. They are Paragraph 110 of the *Command and Staff Principles* and Tables 1 and 24 of *Tables of Organization*, 1938. From Paragraph 110 we find that the collecting agencies fall naturally into four groups as follows:

(1) Military intelligence personnel under our own office.
(2) Troops under the command of the headquarters to which we pertain.
(3) Certain special information services of component units of the command.
(4) Higher and adjacent units.

The first group represent the following activities:

(a) The installation and operation of observation posts.
(b) The action of intelligence scouts, either operating alone or accompanying reconnaissance patrols or raiding parties of combat troops.
(c) The examination of prisoners of war.
(d) The examination of captured enemy documents.
(e) The interrogation of inhabitants, deserters and repatriates.
(f) Liaison with higher, lower and adjacent units, particularly during battle.
(g) The investigation of captured matériel.
(h) The study of the hostile and neutral press.
(i) The study of enemy military regulations and texts.
(j) Secret service activities.

Troops under the command of our headquarters may be given intelligence missions to gain certain specified information. For example, a corps may give an intelligence mission to a division to perform, either as an operation strictly for gaining information or in conjunction with some tactical operation. Full advantage is taken of the command function of our Corps Commander to cause Corps Troops and subordinate units to give us what we want. Again it is necessary to stress the fact that the Corps G-2 must be thoroughly conversant with the powers and limitations of each agency in order to utilize them properly, and he must keep himself informed at all times of their condition and capability for further effort.

The special information services of component units of the command are, in general, technical in nature and operated primarily in the interests of the auxiliary arms which they serve, and not under the supervision of the intelligence section. Mutual interest, however, causes an intimate liaison between these services and the G-2 office and results in a continuous exchange of information. These special services are:

(a) Artillery Information Service, which may have available to it in addition to normal intelligence agencies, sound and flash ranging sections.
(b) Air Intelligence Service.
(c) Antiaircraft Intelligence Service.
(d) Special Signal Corps installations.

Exchange of information between ourselves and higher and adjacent units is normal, but sureness is guaranteed by an adequate system of officer liaison.

Table of Organization No. 24 shows the organization of the corps. We find a Corps Headquarters, three infantry divisions, and a long list of Corps Troops. We are familiar with the intelligence facilities that exist in the divisions, and have just discussed those of the Corps Headquarters, so let us see what we can find in the Corps Troops that will help us.

The Corps Special Troops include the Military Police Battalion, the Signal Battalion and the Ordnance Companies. All three possess capabilities which are useful to G-2. The MPs are especially valuable in counter-espionage work and we would call on them for a number of things if operating in enemy terrain.

The Signal Battalion may make use of commercial wire systems, especially in friendly territory, to gain information of the enemy. They are able to impose censorship on communications if in enemy territory, and the nature of their work may produce considerable information. Wire-tapping or picking up through ground induction have no particular application to open warfare but are used extensively in trench warfare. The Signal Corps has Radio Intelligence Companies, the function of which is the interception of enemy radio transmissions and the location of enemy radio transmitters. We are all familiar with the results of the interception and decoding of enemy radio messages, but the possibilities of G-2 of knowing the location of enemy transmitters warrant discussion. Dispositions within a large enemy force may be indicated by the location of radio transmitters and the movement of transmitters in any direction might well furnish indications of enemy intentions. This sort of thing would be especially valuable when aviation is blanked by weather conditions and when the enemy is careless in his use of radio. A radio intelligence company is attached to a reinforced corps operating independently.

We would turn to the trained Ordnance personnal of the Heavy Maintenance Company for our investigation of captured matériel and new types of enemy projectiles.

Next we find listed the Corps Artillery. In the Corps Artillery Headquarters we find the Artillery Information Service which produces a tremendous volume of information. The location of enemy batteries for counterbattery work, the record of active and silent enemy batteries, the adjustment fire of new batteries; all of this is significant to G-2 as indications. In the Field Artillery Brigade of the corps is located the Sound and Flash Battalion which produces much for the Artillery Information Service, and in addition the brigade represents at least 31 observation posts covering the corps front from which much is seen and reported.

The normal corps has an antiaircraft artillery regiment but the reinforced corps has a brigade. The brigade maintains 163 air-guard stations manned day and night on a 15-mile radius from the defended area. In addition to their warning duties, they plot the course of all hostile and friendly airplanes, report characteristics of new airplanes, and methods of operation and combat. They supply trustworthy indices as to what may be expected in the way of air action, indicate the presence of new air units in the theater, and predict from the action of observation aviation the possibility of aerial attack. Studies of the course and persistent return of hostile observation aviation shows what the hostile

commander is interested in and furnishes our G-2 with valuable indications.

To the Corps Engineers G-2 will look for the fulfillment of his needs in maps and topographical surveys.

The Corps Medical Service includes field hospitals. To these hospitals will be brought a large number of wounded prisoners of war. The shock resulting from both wounds and capture frequently results in a mental letdown, and under kindly treatment and a little astute but casual questioning more information may be forthcoming than would usually be produced in a formal interrogation by an intelligence officer. This potential source of information should never be overlooked by G-2.

The Corps Aviation is the subject of a separate conference and need not be covered now, except to mention that the organic air units represent a total of 64 airplanes and 8 balloons.

We are not likely to get much in the way of information from the Corps Quartermaster Service, but if they will furnish our three meals per diem regularly we will call it square.

When we turn to Table 1, which lists the normal reinforcements of an independent corps, we note additional units to whom we can turn for aid. Of particular value is the Cavalry Brigade, reinforced, the capabilities of which need no further comment.

Experience at maneuvers has forced the conclusion that because of their complete network of communications, their liaison details with front-line infantry battalions, and their numerous observation posts, artillery commanders frequently have information of conditions in our own and in the enemy's front areas before the same information reaches the commanders of supported units. This statement is not the result of branch consciousness at all, but the conclusion just mentioned has prompted the compilation of a set of figures which illustrate the vast number of pointers and feelers that are available to G-2 in the artillery set-up.

The organic artillery of three divisions and of the corps represent in actual figures 72 battery OPs, 30 battalion OPs, 12 regimental OPs, and 4 brigade OPs, a total of 118 observation posts. Add to these the number of liaison details equal to the number of infantry battalions in the corps front. Then consider that the amount of artillery in our Tables of Organization is a minimum quantity, and that our total will be increased by the OPs resulting from attached artillery. So much for the artillery.

Next add the possibilities of information that should originate in infantry intelligence sections and battalion observation posts, from patrols, raiding parties, all front-line units of all sizes, and so on, and we will see that there exists a vast network of feelers and pointers, each of which is a potential source of information for G-2. It requires however the personal touch of G-2, both in training and in encouragement afterwards, to insure that the information which is existent and available is forwarded to the office that can best utilize it. It must be apparent that G-2 has a most tremendous number of tools for the collection of information, that these tools are capable of producing facts which after evaluation and interpretation are more than sufficient to round out a most complete picture. It is firmly believed that the failure of various G-2s in maneuvers can be traced directly to a lack of understanding of the existence and capabilities of these same tools, and that *G-2 would have had the information he wanted if he had known whom to ask and what to ask for.*

At first glance one might say that, with all this great network of information—producing agents, the Corps G-2 would be swamped with messages. Do not overlook the fact that in the progress from front to rear these messages have been subjected to a weeding-out process at the hands of battalion, regimental and brigade S-2s and by division G-2s.

In conclusion a few ideas are offered:

1. Our Army is making heroic efforts to streamline our organization and our transportation. Maneuver rates have been stepped up. To compensate for this we must streamline our staff procedure, including the work of our G-2. That problem is susceptible to bigger and better solutions.

2. G-2 must be one phase ahead of actualities at all times. If a Division G-2 is as a general rule concerned with events which may happen about twenty-four hours away, then a Corps G-2 must look at least three days ahead.

3. The enemy order of battle and the ratings and estimates of enemy units as prepared by GHQ are of great interest to a Corps G-2. When the shock troops appear, something big is in the offing.

4. In the production of combat intelligence, G-2 is dependent upon the troops. G-2 cannot afford to forget that fact, and in his relationship with subordinate intelligence sections he must develop qualities of leadership which we usually associate only with a commander. Complete combat intelligence can be accomplished only by a prompt and perfect liaison, in every sense of the word, among all echelons. This liaison cannot be limited to a mechanical reporting of observations, but must become a quick and intimate exchange of ideas based on mutual confidence.

5. Finally in a unit the size of a corps, G-2 cannot hope to play all the instruments in the orchestra. Teamplay must take the place of individual starring.

A Meeting Engagement

ACTION OF THE FRENCH 55th RESERVE DIVISION AT MONTHYON

September 5, 1914

A Historical Illustration

The purpose of this lecture is to present a study of the division in a meeting engagement. The Command and General Staff School text on the attack defines a meeting engagement as "the contact of two hostile forces, neither of

which is fully developed for combat." From the definition it is evident that in this type of action material advantages rest with the commander whose dispositions are the more favorable and whose knowledge of his opponent is the more complete at the moment of contact. Such advantages are insured by foresight and intelligent planning, based on timely and adequate military intelligence. The extent to which these advantages were attained or sacrificed will be stressed.

The study presented is based on a historical example—an opening episode of the First Battle of the Marne in September 1914.

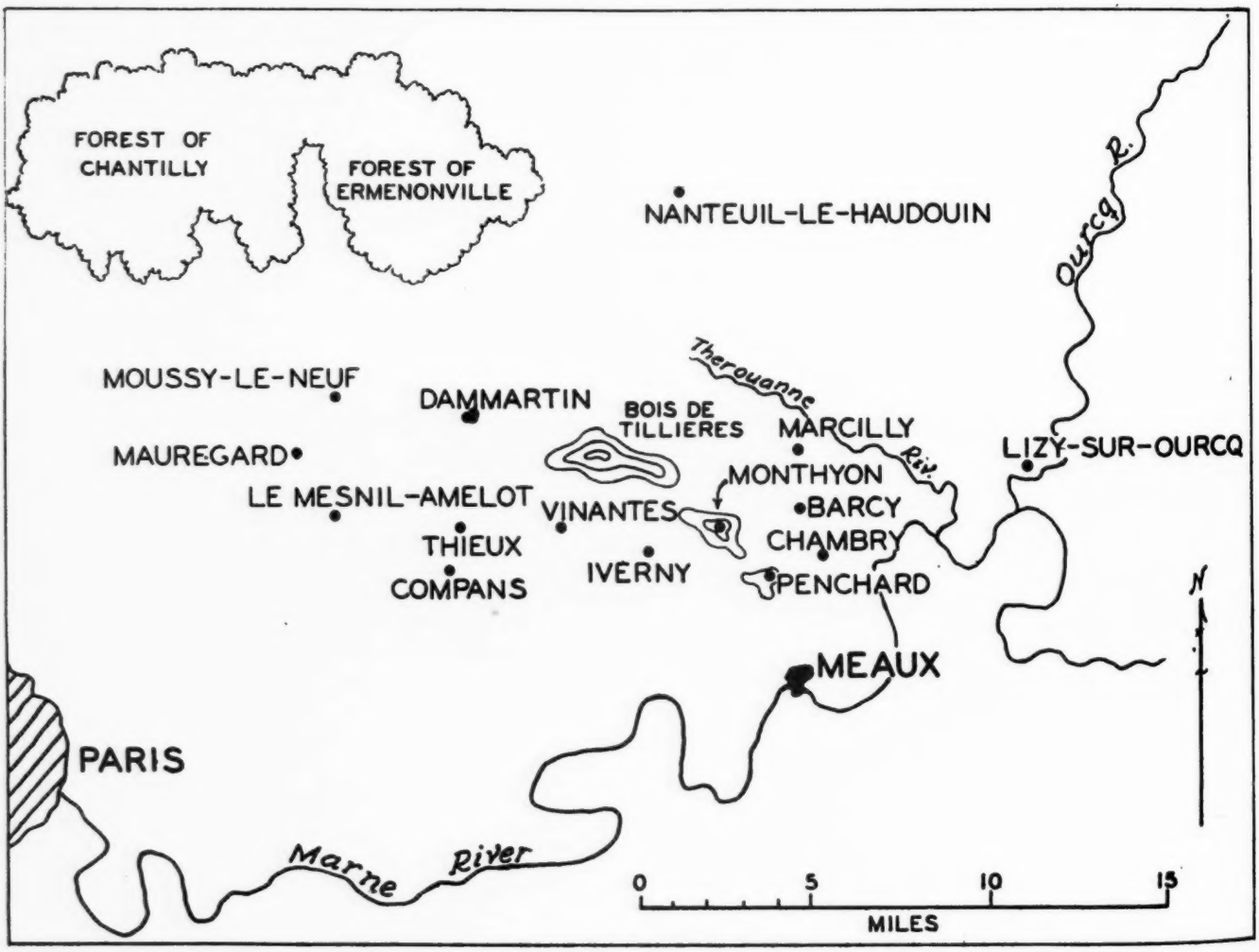
During the month of August the French and British armies had achieved no tactical successes of importance against the surging sweep of the powerful German right wing through Belgium and northern France. However, at Mons on August 23d and again at Le Cateau on the 26th, courageous stands by the British had somewhat bewildered von Kluck, the commander of the German First Army. When the French Fifth Army stopped south of Guise to strike back at its pursuers, von Bulow was so upset that he began to close his German Second Army toward the German Third Army on his left and von Kluck's army was dragged so far to the southeast that Paris was no longer included in the envelopment.

On the night of September 4th-5th the German First Army was known by the Allies to have changed direction to the southeast and to have crossed its mass to the south of the Marne River, east of Meaux (See Sketch No. 1), thus apparently exposing its right flank to an attack by the newly created French Sixth Army. The French commander-in-chief had decided to pass to the offensive. The French Sixth Army was to advance to the Ourcq River on September 5th and attack the exposed hostile flank on the 6th. The 5th Group of Reserve Divisions of the Sixth Army, disposed about Dammartin, faced generally northeast, as shown on Sketch No. 2.

The 55th Reserve Division, with a Moroccan brigade and Gillet's Cavalry Brigade attached, was an element of the 5th Group of Reserve Divisions. The division was organized as follows:

109th Brigade—204th, 282d, and 289th Reserve Infantry Regiments
110th Brigade—231st, 246th, and 276th Reserve Infantry Regiments
3 Battalions of 75-mm guns from the 13th, 30th, and 45th Reserve Artillery Regiments
2 Squadrons of the 32d Dragoons.

Each infantry regiment was organized with two battalions and included four machine guns.



SKETCH NO. 1

The artillery battalions had three batteries each.

On the night of September 4th-5th the division was disposed as shown on Sketch No. 2. The 110th Brigade, with two battalions of artillery attached, occupied the division's defensive position. The 231st Reserve Infantry furnished the outpost. The 109th Brigade, the division cavalry, and the remaining battalion of artillery were in division reserve.

Digressing for a brief survey of the terrain covered by Sketch No. 1, we find that Dammartin is twenty miles northeast of Paris. To the north lie the Forests of Ermenonville and Chantilly and to the south the Marne River flows west to join the Seine. Nine miles east of Monthyon the Ourcq River empties into the Marne. The district is traversed in every direction by an adequate number of all-weather roads. The open, slightly rolling ground, on which the crops had been harvested, afforded extended fields of fire and easy routes of advance across country. Vision was obstructed only by the buildings and the rows of poplar trees which lined the roads. The hills of Penchard, Monthyon, and Tillieres provided excellent observation over the district all the way to Paris toward the west and as far as the Ourcq to the east.

General Operations Order No. 13, 5th Group of Reserve Divisions, was received without previous warning at the command post of the 55th Reserve Division at 4:30 AM, September 5th. The pertinent contents of the order, as amended by subsequent fragmentary orders, were in substance as follows:

The main body of the German First Army had turned southeast and crossed the Marne. There are no enemy forces of importance in the forests north of the Sixth Army. Yesterday, columns which appear to constitute the German right flank were marching southeast from Nanteuil-le-Haudouin toward Meaux and Lizy-sur-Ourq. (See Sketch No. 1.)

The Sixth Army will change direction toward the Ourcq, prepared to pass to the offensive.

This group will deploy today in preparation for an offensive toward the east.

Main body: Echeloned between the lines: (see Sketch No. 2) Villeroy—Iverny—Montge, and Compans—Villeneuve.

Advance guards: Penchard—Monthyon—St. Soupplets.

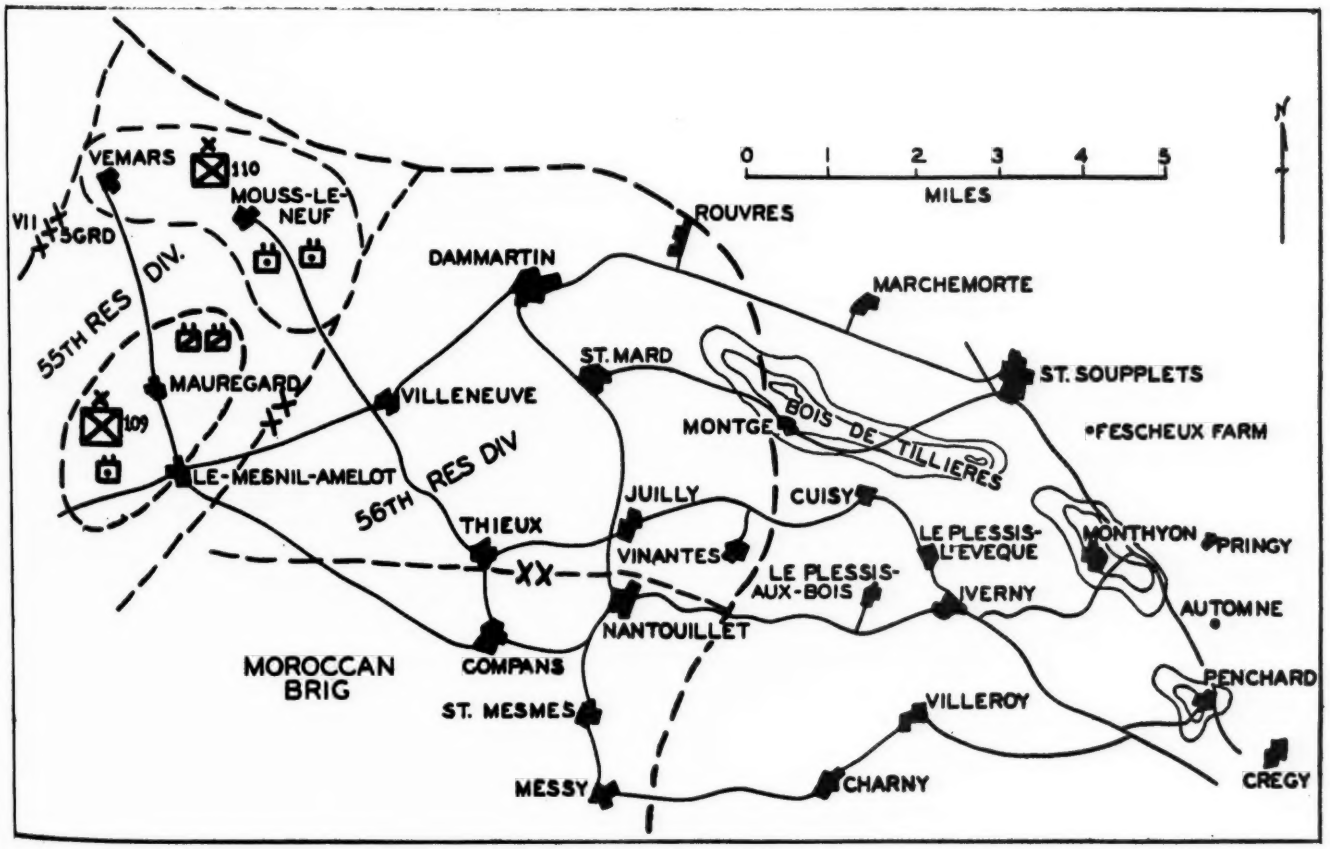
Outpost line: Cregy—Pringy—northeastern exits of St. Soupplets.

Gillet's Cavalry Brigade will cover the right of the group to the north bank of the Marne.

The Moroccan brigade will advance via: Messy—Charny—Villeroy—Penchard.

The 56th Reserve Division will march via: Dammartin—St Mard—Montge—St Soupplets.

The 55th Reserve Division, employing routes between those assigned to the Moroccan brigade and the 56th Reserve Division, will advance its main body to the area: Iverny — Le Plessis-l'Eveque — Vinantes — Nantouillet—Thieux—Compans and its advance guard



SKETCH No. 2

to Monthyon, with its outpost on the line: Automne—Pringy—Fescheux Farm.

All elements of the group will be south of the le-Mesnil-Amelot—Dammartin road by 8:00 AM.

This order invites adverse criticism on at least three points: the time allowed to subordinate units for the initiation of the actions ordered, the language in which the information of the enemy is given, and the use of Gillet's Cavalry Brigade.

The 5th Group of Reserve Divisions had gotten out this order in two and one-half hours after the receipt of the army order. Perhaps a written order could not have been prepared and distributed in less time, but, certainly, staff officers bearing warning orders could have been dispatched to the divisions not later than 2:00 AM.

With competent commanders and well trained staffs a mere recital of the latest observations of the enemy may be sufficient information of the hostile situation to include in paragraph one of the field order. However, this was an early operation of a war and the personnel of the 5th Group of Reserve Divisions was not well trained, even if judged by peace time standards. Since the commanders receiving General Order No. 13 misinterpreted the information of the enemy as given, we may say that it was insufficient in this situation. Apparently the commanders should have been definitely alerted to all enemy capabilities. This could have been accomplished by adding after reference to the German columns: Their later movements have not been reported. These columns or other hostile covering forces may have remained north of the Marne and west of the Ourcq, in which case they are capable of either offensive or defensive action at any point east of our outpost line. Penchard, Monthyon, and the Tillieres are especially favorable to the action of such forces. If considered too lengthy for the field order, this information could have been transmitted to the subordinate commanders orally or in special messages.

The 5th Group of Reserve Divisions was to change direction and march into a region known to have been traversed recently by the enemy in strength. No army cavalry covered the front and no air service was available for reconnaissance missions. There was no hostile threat against the south flank of the group and the Marne River, flowing within two or three miles of the southern infantry column, created a naturally strong flank. Gillet's Cavalry Brigade should have been employed to reconnoiter the group's zone of advance at least as far east as the Ourcq. It should have been instructed, if forced to retire, to hold the enemy east of the line: Penchard—Monthyon—Tillieres until the infantry advance guards were in position on that line.

If the 55th Reserve Division was to clear the le-Mesnil-Amelot—Dammartin road by 8:00 AM, its advance guard must march not later than 6:00 AM. Pressed for time as he was, the division commander appears to have dismissed the enemy with the assumption that no hostile interference of importance would be encountered during the day. Since the terrain of this area would be a material factor in the commander's decision and plans, only if utilized by the Germans, this false premise as to the enemy led naturally to a failure by the commander to include a consideration of the terrain in his estimate of the situation. The division order, dispatched to the brigades at 5:00 AM and as later amended, read in substance:

The 110th Brigade, with the division cavalry and two battalions of artillery attached, will march at once via: Mouss-le-Neuf — Thieux — Nantouillet — Iverny. (See Sketch No. 2). It will provide the advance guard for the entire division after passing Thieux and will establish the outpost. Dispositions at the end of the march:

Main body: le Plessis-l'Eveque—le Plessis-aux-Bois —Iverny.
Advance guard: Monthyon.
Outpost line: Automne—Pringy—Fescheux Farm.

The 109th Brigade, with one battalion of artillery attached, will march at once via: Mauregard—le-Mesnil-Amelot—Compans. After passing Compans the brigade will follow the 110th Brigade.

Bivouac area: Vinantes — Nantouillet — Thieux—Compans.

General Leguay, commanding the 55th Reserve Division, and his staff are to be commended in that they consumed only thirty minutes of the limited time available in the preparation of the division order. The order was unfortunately defective in several respects. It included no information of the enemy, no reference to the march of the Moroccan brigade and the 56th Reserve Division, and no provisions for maintaining contact with those flank units. No mention was made of the Sixth Army's contemplated offensive to the east. These were all errors of omission and could have been corrected by sending to the brigade staff officers who were familiar with the situation and the division commander's plans.

The information available to the division commander eliminated the enemy only from the forests north of the Sixth Army. The later movements of the hostile columns observed marching toward the Marne and the Ourcq had not been reported. There was no positive information that the area into which the division was to march was free of the enemy. The area had not been under observation since early the day before. The Germans might have halted or might have turned west. Other columns, following the German First Army, might have entered the triangle between the Marne and the Ourcq. The enemy should have been considered capable of acting either offensively or defensively at any point east of the outpost line of the 5th Group of Reserve Divisions. In particular, he should have been considered capable of—

A determined defense on the Monthyon ridge,

Offensive action from the directions of Penchard, Monthyon, and the Bois de Tillieres, or

Offensive action against the outpost and bivouac areas of the division at the conclusion of the day's march.

A commander studies the terrain in order to utilize its advantages and to avoid or neutralize its unfavorable features. In this situation there was no time available for a reconnaissance of the ground; however, a hurried map reconnaissance would have revealed much valuable information.

If the march of the division had been unopposed, the excellent roads and the unobstructed, open terrain would have facilitated the movements of the division.

The Monthyon ridge favored hostile defensive action and afforded an excellent position for a holding attack, with the main attack made from the eastern spur of the Bois de Tillieres. Penchard was favorable to defensive action toward the west but not to offensive action against the 55th Reserve Division. The eastern spur of the Bois de Tillieres provided a concealed assembly area and commanded the north flank of the division's zone of advance and was, consequently, favorable to offensive action against the left flank of the 55th Reserve Division.

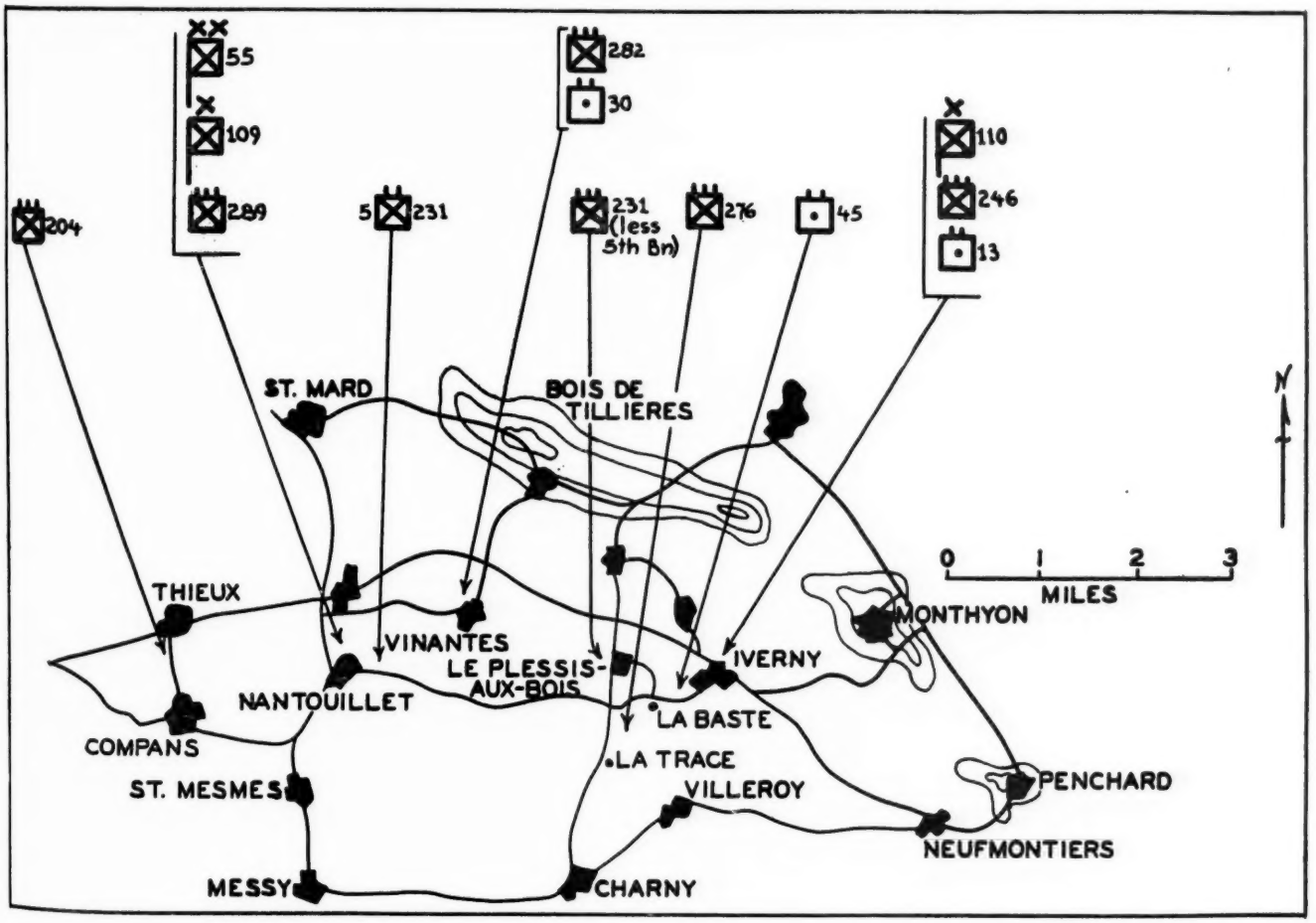
The Bois de Tillieres was the most favorable area from which the 55th Reserve Division could launch a main attack against Monthyon. The ground south of Iverny was decidedly unfavorable to a main attack against Monthyon.

The denial of the Monthyon and Tillieres ridges to the enemy prior to the occupation of Monthyon by the advance guard of the division would have assured the uninterrupted march of the 55th Reserve Division.

The advance ordered by General Leguay was actually a march in a single column. Two excellent roads were available to the division—a southern route: Mauregard—Compans—Nantouillet—Iverny—Monthyon, and a northern route: Mouss-le-Neuf—Thieux—Juilly—Cuisy. The division front was narrow and could have been covered by one column. Two columns favored a quick blow against the most probable hostile threat—straight to the front; however, the possibility of an offensive thrust against the division's north flank from the Bois de Tillieres should not have been disregarded. A two-column formation, with the north column echeloned to the left rear, would have facilitated action straight to the front without uncovering the north flank.

The 109th Brigade, being in division reserve, would have been able to march more promptly and should have been physically fresher. It should have been assigned to the longer southern route. One platoon of cavalry and two battalions of artillery should have been attached to this column. The 110th Brigade, with one battalion of artillery attached, should have marched by the northern route.

March security is best insured by adequate timely information of the enemy's movements and by holding key points along the route of march. In this situation, the importance of the Monthyon and Tillieres ridges indicates that the division cavalry, less one platoon, should have been dispatched at the earliest possible moment to secure these two key points. If sufficient motor transportation of any type could have been procured, two reconnaissance detachments should have been improvised and sent forward to relieve the cavalry and hold Monthyon and the Bois de Tillieres until the arrival of the infantry advance guard. If reconnaissance detachments could not have been transported in advance of the marching infantry, the cavalry should have held the two



Sketch No. 3

vital ridges until relieved by the advance guard. Reconnaissance east of the Monthyon ridge should have been conducted by the division cavalry as vigorously as was consistent with its primary mission of securing Monthyon and the Bois de Tillieres.

Orders did not reach the regiments of the 55th Reserve Division until 6:00 AM. Both brigades were two hours late in clearing the le-Mesnil-Amelot—Dammartin road. The Commanding General, 110th Brigade, employed the 246th Reserve Infantry, with one platoon of cavalry and one battalion of artillery attached, as the advance guard for the brigade and the division. Not knowing of the march of the 56th Reserve Division on his left flank, he dispatched the attached division cavalry, less one platoon, to the north of the Bois de Tillieres with orders to march on Rouvres and Marchemorte. (See Sketch No. 2).

At 12:30 PM the division, less its advance guard, was disposed as follows: (see Sketch No. 3) the 282d Reserve Infantry and one battalion of artillery at Vinantes; the 289th Reserve Infantry at Nantouillet; the 204th Reserve Infantry near the southern exits of Thieux; the 276th Reserve Infantry between La Baste and La Trace; the 231st Reserve Infantry, less the 5th Battalion, at Le Plessis-aux-Bois; the 5th Battalion, 231st Reserve Infantry on the road east of Nantouillet; and one battalion of artillery just west of Iverny. The division ommander and the commander of the 109th Brigade were at Nantouillet. At 12:00 noon the advance guard commander had closed up the advance guard in Iverny for lunch and thirty minutes rest. The entire 246th Reserve Infantry, with the attached battalion of artillery, was in the village. The commander of the 110th Brigade was with the advance guard commander in Iverny. The division cavalry had not reported since its departure. The cavalry platoon of the advance guard had not been heard from since it entered Le Plessis-aux-Bois at 11:00 AM.

The point of the advance guard moved out from Iverny at 12:30 PM. Suddenly shells began to fall about the village. German 77-mm guns were firing from the high ground southeast of Iverny. Numerous other pieces were going into position. German infantry opened fire from the slopes west of Monthyon and additional infantry was debouching from the town. Between Monthyon and the Tillieres the flashes of another artillery battery could be seen. The leading company of the advance guard was driven from the Monthyon road by machine-gun fire but managed to deploy south of the road after suffering heavy losses. The second company was pinned to the ground at the eastern exits of the village. The ground south, east, and immediately north of Iverny was absolutely dominated by the German position. The open fields provided neither concealment from observation nor cover from fire. To the south the Moroccans could be seen marching along the road east of Villeroy. Their advance guard was approaching Penchard. To the north, obscured from view by the Bois de Tillieres, the leading elements of the 56th Reserve Division were entering St Souplets. (See Sketch No. 2).

The advance guard commander had lost his freedom of maneuver by permitting his command to be surprised in so unfavorable a situation. He could not move detachments to reconnoiter the hostile situation or to seize the favorable terrain to the north. He must protect the main body against the enemy's advance even though it necessitated the sacrifice of his command. The only satisfactory plan open to him was to organize and defend the village of Iverny in order to protect the division.

The division commander was not only without timely information but was also out of communication with the brigade. These facts appear to have justified some independent action by the Commanding General, 110th Brigade. That officer was ignorant of the hostile strength and dispositions but the enemy's position and his aggressive attitude should have indicated that action by the entire division would be required to capture Monthyon. In such situations, independent action by column commanders is highly undesirable as it usually results in inadequate, piecemeal operations. The division commander was less than four miles distant. He could have been informed of the situation and his intentions determined within an hour. During that hour the brigade commander should have taken such independent action as necessary to:

Secure the command,
Develop the hostile situation, and
Secure terrain favorable to the employment of the division.

It appears that his decision should have been: to protect the deployment of the division pending instructions from the division commander. His plan should have provided for:

Approval of the defensive action initiated by the advance guard commander,
The reinforcement of the advance guard with the fires of the artillery battalion then west of Iverny,
The seizure of the eastern spur of the Bois de Tillieres with not to exceed one battalion of the 276th Reserve Infantry, and
A report to the division commander of the situation and the actions taken, with a request for instructions.

As his leading elements neared the unsecured vital terrain of Monthyon, it became increasingly important that the division commander be in a position to assume prompt control of any situation which might develop. He should have marched near the head of the main body of his leading brigade as it approached Monthyon or he should have provided for a control point in the vicinity of Iverny in constant communication with the division command post. Having failed to adopt either measure, the general should have hastened forward to join the commander of his leading brigade at the first sounds of heavy firing to the front. He should have indicated immediately his intentions as a general guide for the column and advance guard commanders.

Bearing in mind that the 55th Reserve Division constituted but one column in the advance of the 5th Group of Reserve Divisions, we may well ask: did the situation at 12:30 PM justify the division commander in commiting his division to action without instructions from the group commander? The mission of the 5th Group of Reserve Divisions would be accomplished when its advance guards had secured the line: Penchard—Monthyon—St Soupplets. The other columns of the group were already on their objectives. The unaccomplished portion of the group mission was the task assigned to the 55th Reserve Division. Its completion should

not have required decisive action by the other columns. By failing to keep abreast of the adjacent columns, the 55th Reserve Division had exposed their interior flanks to a serious threat from Monthyon. The situation demanded prompt action and the group commander was not present or in communication with the division. This is certainly a case in which the division commander was justified in independent offensive action, without reference to the group commander. The commander of the 110th Brigade should have been informed that the division would attack and directed to continue the defensive action by the advance guard.

As is usual in connection with a decision to attack in a meeting engagement, the choice between a piecemeal and a coordinated attack had to be made by the commander. The possession of Monthyon and the outpost line to the east would accomplish the division's mission. The attack would thus have a limited objective—one of the three factors generally essential to the justification of piecemeal action. However, time was not of such importance that no other form of offensive action would accomplish the mission and the 55th Reserve Division did not have superiority in available combat strength, consequently, a piecemeal attack should have been eliminated from further consideration.

The decision to make a coordinated attack should have been followed with the least practical delay by instructions for the deployment of the command. The situation so clearly indicated the proper general direction of attack that instructions to initiate development should have been issued almost immediately. They should have read in substance:

> The division will attack and capture Monthyon without delay.
>
> The 110th Brigade will cover the development of the division from the direction of Monthyon with the forces at present engaged and, employing not to exceed one additional battalion, will seize and hold the eastern spur of the Tillieres.
>
> The 109th Brigade will march at once on Cuisy with a view to making its attack in the general direction: eastern spur of the Tillieres—Monthyon.

Reconnaissance should have been intensified in order that the movements of the 109th Brigade to assembly areas and attack positions would have been uninterrupted.

An attack order should have been issued as soon as the eastern spur of the Bois de Tillieres was in the division's possession.

We turn again to the historical solution. Immediately following his initial contact with the enemy, the advance guard commander deployed his regiment on a north-south line through the eastern exits of Iverny in order to check the hostile advance. At 12:45 PM the Commanding General, 110th Brigade, decided to attack at once. His orders were in substance as follows: (See Sketch No. 2) .

> The 246th Reserve Infantry will attack Monthyon.
>
> The attack will be supported by the two battalions of artillery. It will be covered on the south by a battalion of the 276th Reserve Infantry, moving in the direction: Villeroy—Penchard and on the north by the 276th Reserve Infantry, less one battalion, in the direction: Le Plessis-l'Eveque—St Soupplets.
>
> The 231st Reserve Infantry will await orders in reserve at Le Plessis-aux-Bois.

Repeated attempts by the 246th Reserve Infantry to advance were repulsed. The 5th Battalion, 276th Reserve Infantry, committed in the direction of Villeroy, became involved in the action of the Moroccans and was thereafter lost to its brigade. The 276th Reserve Infantry, less its 5th Battalion, deployed about Le Plessis-l'Eveque with a detachment on the eastern spur of the Tillieres, which was found to be unoccupied. Contact was established with elements of the 56th Reserve Division advancing on St Soupplets and a slight advance was made in the direction of Monthyon. The Moroccans contacted the enemy at Penchard at 1:30 PM. After an initial success, the French colonials were checked by a vigorous counterattack. Between 3:00 PM and 4:00 PM the Germans launched a strong attack from the cover of the Monthyon ridge in the direction of the Bois de Tillieres.

Although the heavy firing to the front was distinctly heard at his command post, the Commanding General, 55th Reserve Division, remained at Nantouillet until near 5:00 PM, ignorant of the situation and out of communication with the 110th Brigade. At 4:00 PM he dispatched the battalion of artillery at Vinants toward Villeroy. Fifteen minutes later the 109th Brigade was directed to move the 289th and 204th Reserve Infantries to Le Plessis-aux-Bois.

At 5.00 PM the 246th Reserve Infantry was still holding its line through Iverny, hard pressed by the Germans. The 276th Reserve Infantry, less one of its two battalions, was still in possession of Le Plessis-l'Eveque but its left had been pushed back almost to Cuisy. (See Sketch No. 4.) The regimental commander had reported that his battalion could not hold much longer. The 231st Reserve Infantry, ordered forward to support the defense of Iverny at 2:00 PM and again at 3:40 PM, had not been heard from. The Moroccans were in retreat through Villeroy and Charny. To the north the 56th Reserve Division was being steadily driven back through the Bois de Tillieres. Three battalions of the 110th Brigade had been fighting desperately for four and one-half hours, with no word from the division commander. The brigade commander, feeling that he had been abandoned and fearing that he would be enveloped, ordered the 246th Reserve Infantry to withdraw from Iverny to the line: La Baste—La Trace. The movement was completed in good order by 5:30 PM.

As the 246th Reserve Infantry reached its new line it was joined by the 231st Reserve Infantry. At about the same time a messenger reported that the 109th Brigade was beginning to arrive at Le Plessis-aux-Bois. Encouraged by the appearance of his own reserves and the approach of other elements of the division, the commander of the 110th Brigade decided to renew the attack at once. The 246th Reserve Infantry was ordered to capture the southern portion of Monthyon, the 231st Reserve Infantry the northern section.

The division commander arrived from Nantouillet at his new command post one-half mile west of Le Plessis-aux-Bois at approximately 5:20 PM. By 5:45 PM he had been informed of the situation, including the offensive ordered by the Commanding General, 110th Brigade. He knew that the 289th Reserve Infantry had arrived in Le Plessis-aux-

Bois and that the Germans had not occupied Iverny. No instructions had been received from the group commander, who was at Thieux. Darkness would commence at 7:30 PM.

What should have been the decision of the division commander at 5:45 PM?

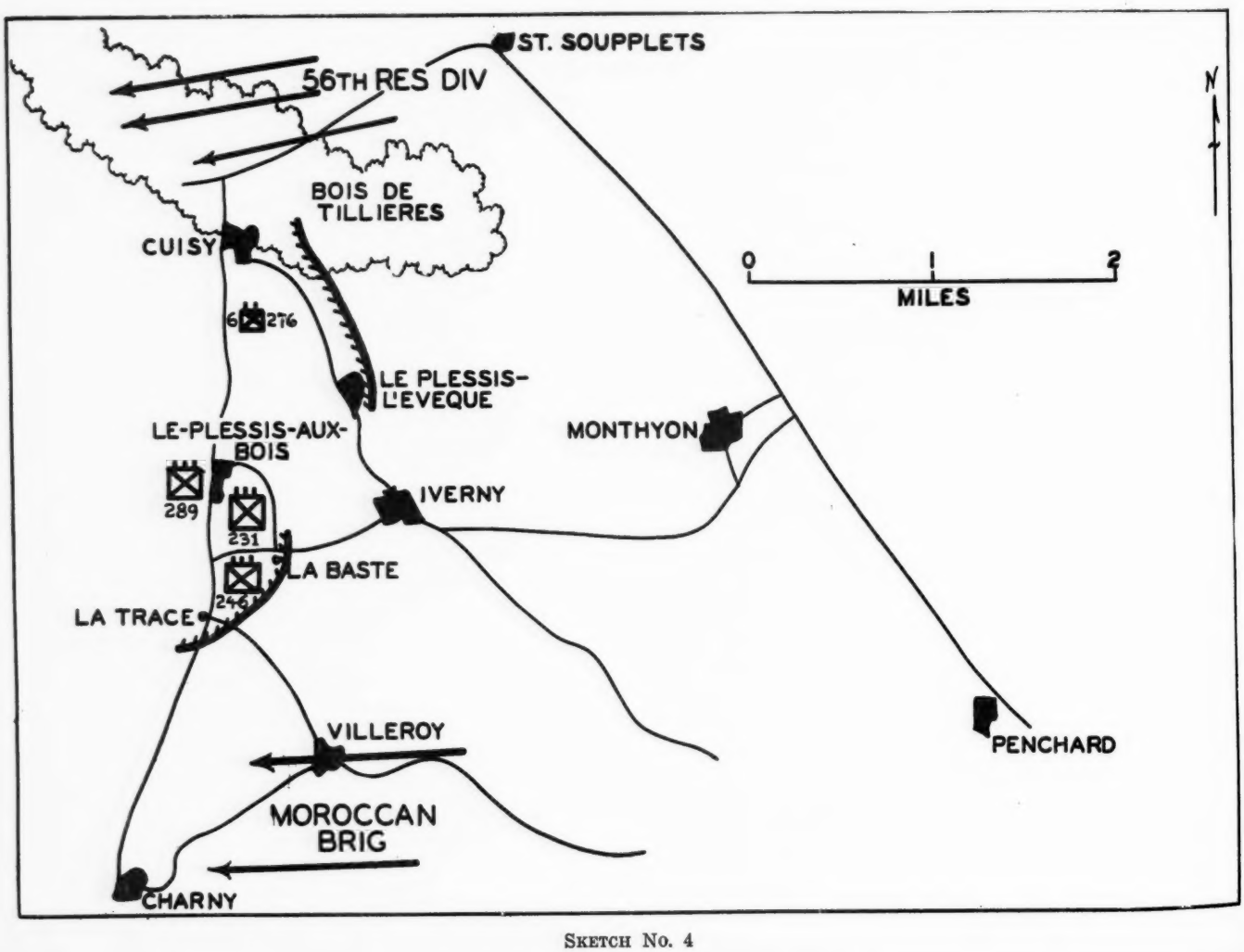
Both flanks of the division were exposed. Disposed as it was, it could not have attacked to relieve the pressure on either of the hard pressed adjacent columns prior to darkness. Should a frontal attack have succeeded in capturing Monthyon, it is likely that it would have isolated the division in a position from which the group would have been unable to extricate it. The situation was one requiring a decision by the group commander. It is believed that the division commander's decision should have been: to reoccupy Iverny and maintain the Le Plessis-l'Eveque position while requesting instructions from the group commander.

The 231st and 246th Reserve Infantries advanced at 6:00 PM. Both regiments lost direction and arrived in Iverny simultaneously. (See Sketch No. 2.) Neither regiment left the village. The division commander decided at 5:45 PM to attack with the 109th Brigade. The 289th Reserve Infantry was to pass through the 110th Brigade with the southern portion of Monthyon as its objective. The 282d Reserve Infantry, moving from Vinantes, was to attack on the right of the 289th. The leading battalion of the 109th Reserve Infantry crossed the line of departure at 6:30 PM. Committed to the fire swept fields about Iverny without time for preliminary reconnaissance, both regiments gravitated toward the cover of Iverny. By 7:00 PM two battalions of the 231st, two of the 246th, one of the 282d, and one of the 289th—six of the eight battalions committed—were huddled together in Iverny. The hopeless confusion in the village broke up the attack. Darkness was at hand and firing gradually ceased on both sides.

To complete the story of Monthyon a brief acount of the German actions west of the Ourcq on September 4, 1914 will be given.

The IV Reserve Corps of the German First Army, with the 4th Cavalry Division attached, had remained north of the Marne in the vicinity of Nanteul-le-Haudouin, undiscovered by the Allied reconnaissance. (See Sketch No. 1.) The corps, commanded by General von Gronau, consisted of the 7th Reserve Division and the 22d Reserve Division, less one brigade. It included two regiments of 77-mm guns but had no medium or heavy artillery and no aviation was available to its commander.

With orders to cover the right flank and rear of the German First Army from the vicinity of Marcilly and Chambry, General von Gronau marched his corps south at daylight, September 5th. The troops were in their new bivouac areas by 10:00 AM—the 7th Reserve Division in the area: Marcilly—Barcy and the 22d Reserve Division at Chambry.



SKETCH No. 4

By 10:45 AM it was apparent from reconnaissance reports that a French movement of serious proportions was in progress toward the east. The corps commander had to have information. His cavalry had reported that it was unable to penetrate the hostile screen. There was no air service. Turning to his chief of staff, von Gronau said, "Colonel, there is no help for it. We must attack." Orders were issued promptly. The IV Reserve Corps was directed to attack in order to determine the hostile strength, dispositions, and intentions. The 7th Reserve Division was ordered to advance to the attack via Cuisy and Montge on St Mard. (See Sketch No. 2.) The 4th Cavalry Division was to advance through Marchemorte in the direction of Dammartin.

The 7th Reserve Division marched at 11:45 AM from Marcilly and Barcy. (See Sketch No. 1). Recognizing the tactical importance of Monthyon, the division commander directed both of his columns to march on the heights about the town. As the advance guards debouched on Monthyon, the French were discovered resting in Iverny. How the French were surprised and pinned to the ground about Iverny has been presented. Von Gronau had followed his advance guard into Monthyon. From the commanding heights of the village he observed the terrain to his front and flanks. To the south the Moroccans were in plain view. To his front the situation was well in hand. To the north French troops were seen entering the Bois de Tillieres at Montge. Their strength and movement had to be discovered. Again von Gronau's decision was prompt. Two battalions of the 7th Reserve Division, posted about Monthyon, would contain the French at Iverny. The remainder of the division would attack at once in the direction of the eastern spur of the Tillieres. The success of the attack is already known.

The 22d Reserve Division had moved from Chambry to a position between Barcy and Monthyon. Its commander had joined the corps commander at Monthyon. As the Moroccans entered Penchard, the division was ordered to attack and capture the high ground in that vicinity. The French colonials, struck in front and flank, were soon in retreat toward Villeroy and Charny.

By 5:00 PM von Gronau knew that his infantry had engaged two and one-half French divisions. His cavalry had discovered the advance of the French VII Corps from the direction of Dammartin. Not caring to expose his command to the dangers of an envelopment, he ordered his divisions to withdraw under cover of darkness. The French were as unprepared for the withdrawal as they had been for the attack and the German IV Reserve Corps occupied its new position east of the Therouanne River without interference. (See Sketch No. 1)

Von Gronau was a commander of exemplary character and ability. He understood the full significance of his mission. When the French appeared on his flank, he realized instantly that he must determine their strength and intentions. He knew clearly what he wanted and he did not accept the strength of the hostile screen and his lack of aviation as an excuse for inaction. His decision was prompt, courageous, and well suited to the situation and his mission. Having directed his divisions toward their probable objectives, he hastened forward to see for himself. Knowing the terrain, he impressed his personal direction on the combat from the very beginning by prescribing the plan of maneuver of each of his units with short oral orders, pointing out the objectives on the ground. His handling of the IV Reserve Corps forced the French to reveal their strength and intentions prematurely and thereby rendered an inestimable service to his army.

The lessons of Monthyon are too obvious to warrant a lengthy reiteration. From those lessons the following valuable check list is compiled for commanders confronted with the possibility of a meeting engagement.

In planning the march:

1. Have subordinate commanders been allowed reasonable time in which to plan and initiate their designated tasks?

2. Have subordinate commanders been supplied with sufficient information of both the friendly and the hostile situations to enable them to effectively plan their assigned missions?

3. Have all enemy capabilities been carefully weighed?

4. Has the terrain been accurately evaluated, its advantages utilized, and its unfavorable features avoided or neutralized?

5. Does the march formation contemplated facilitate the employment of the entire command against the enemy's most probable lines of action without sacrificing the flexibility necessary to insure prompt action against other enemy capabilities?

6. Have intelligence missions been carefully planned to insure that all available agencies are employed most effectively in the collection of that information required to produce the military intelligence essential to timely and correct future decisions?

7. Do the measures for security insure freedom of maneuver under all possible circumstances of contact with the enemy?

8. Is the cavalry being employed boldly and vigorously on the missions that will contribute most to the success of the scheme of maneuver adopted?

9. Have all practical provisions been made to deny vital features of the terrain to the enemy?

10. Is prompt resumption of control by the commander insured in event of contact with the enemy?

After contact with the enemy

1. Is the entire command adequately secured and its freedom of maneuver assured?

2. Is the hostile situation being developed to the maximum possible extent?

3. Are vital terrain features being secured?

4. Does the situation warrant independent action by the commander concerned?

5. Is piecemeal action desirable?

6. Is the command being developed for combat as effectively and expeditiously as possible?

7. Has full information of the situation been furnished to all interested commanders?

Map Problem No. 17

16 February, 1939

	Paragraphs
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II.—A Solution	4
III.—Discussion	5-7

SECTION I

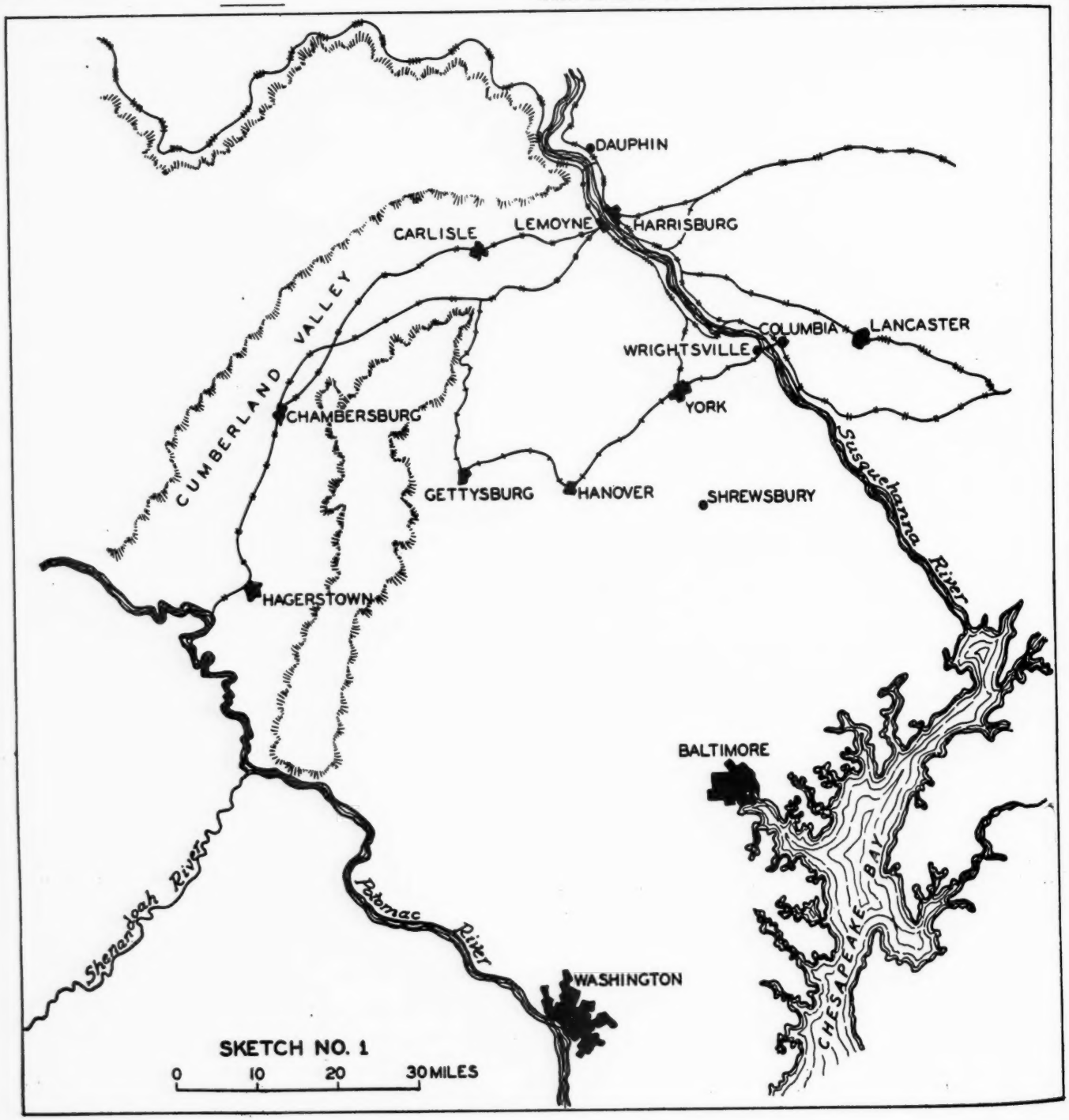
Situation and Requirement

	Paragraph
General situation	1
Special situation	2
Requirement	3

1. GENERAL SITUATION.—*a. Maps.*—Sketch No. 1 and Special Map A, 1:62,500.

b. Main forces.—The Blue (United States) main military forces are engaged in Virginia against an expeditionary force sent out by Red, an oversea power. The Defenses of Washington are garrisoned by the Blue 29th Division and weak Blue forces are observing the Potomac River through the Cumberland Valley.

c. The Blue I Corps.—The Blue I Corps, reinforced, has been ordered to concentrate between the Susquehanna and



Potomac Rivers with the mission of protecting the important rail lines crossing the Susquehanna River from Columbia to Dauphin, both inclusive, against an impending threat by a Red force landing at Baltimore.

2. SPECIAL SITUATION.—*a. Mission and composition of the Blue 1st Division.*—The Commanding General, Blue I Corps, dispatched the 1st Division, reinforced, to cover the detrainment of the remainder of the corps in the Carlisle—Lemoyne area and to protect the rail facilities at York and the railway bridge at Wrightsville. The following units are attached to the 1st Division:

1st Cavalry Brigade (less the 2d Cavalry), reinforced
901st Cavalry Squadron, reinforced
901st Observation Squadron (Separate)
901st Balloon Squadron
Provisional Battalion, 104th Coast Artillery (AA)
1st Battalion, 901st Chemical Regiment (Motorized)
Detachment, 901st Signal Battalion (Motorized)
910th Infantry (L of C), reinforced.

b. The 1st Cavalry Brigade.—The 1st Cavalry Brigade (less the 2d Cavalry), reinforced, reached York during the night, 13-14 February.

c. The enemy.—Red landed troops of all arms in Baltimore, commencing 13 February. Red cavalry, estimated to be a brigade (less one or two squadrons), reinforced by light artillery and a combat-car squadron (27 cars), advanced north and was stopped south of York by the Blue cavalry during the morning of 15 February. A force of all arms marched north from Baltimore during the night, 14-15 February. Between dark, 14 February, and shortly before daylight, 16 February, weather conditions rendered aerial observation ineffective except for a few brief periods. Based on such observations as the Blue air service was able to make, G-2, 1st Division, estimated the force of all arms advancing from Baltimore to be a brigade of infantry with air service and at least a regiment of light and a battalion of medium artillery. He calculated that the leading elements of this force could reach the line of cavalry contact by 4:00 AM, 16 February. Prior to the hostile landing in Baltimore, railway rolling stock and motor vehicles were removed from the area about Baltimore to such an extent that it is estimated that Red will be unable to procure locally sufficient rail or motor transportation for material movements of either troops or supplies.

d. The decision of Major General A at 8:45 PM, 15 February.—After a march of approximately twelve miles, the remaining organic and attached units of the 1st Division reached the vicinity of York prior to dark, 15 February. At 8:45 PM Major General A, commanding the 1st Division, decided to relieve the cavalry on a portion of its front at daylight, 16 February, and develop the hostile situation with a view to attacking and defeating the Reds south of York.

e. The situation at 7:00 AM, 16 February.—The 1st Brigade, with the 1st Field Artillery and the 1st Battalion 3d Field Artillery attached, relieved the cavalry on the front: road junction 396 (395-761)—Spry (402-760) during the night, 15-16 February, and advanced at daylight with orders to seize the line: BM 453 (394-753)—road junction 829 (398-753)—road junction at (401.1-754.7).

The situation at 7:00 AM, 16 February, is as shown on Special Map A.

After a short initial advance the four assault battalions of the 1st Brigade encountered heavy machine-gun and rifle fire from several commanding positions on the line: northern edge of woods northeast of Reynolds Mill (396-757)—hill at (403.2-759.2).

The 1st Squadron 1st Cavalry, with the 901st Cavalry Squadron attached, is opposed by at least an equal force of Red cavalry west of South Branch Codorus Creek. The 1st Cavalry Brigade (less the 2d Cavalry and the 1st Squadron 1st Cavalry), reinforced, is holding its position on the line: Relay (405-760)—Windsor (411-760), but is unable to advance against the opposing Red cavalry. The cavalry brigade commander has reported that the Red combat-car squadron suffered heavy casualties among its cars when it attempted to break through his defenses in the direction of Wrightsville during the late afternoon, 15 February.

The 2d Brigade and the 2d Field Artillery are in concealed bivouacs in the area: Golden (407-766)—Yorkana (410-767)—Hellam (409-771)—Spring Plains (405-768). Units of the division not otherwise accounted for are in York.

f. Previous G-2 estimate of the enemy situation.—The last G-2 estimate of the enemy situation presented by G-2, 1st Division, covered the hostile situation to include 7:00 AM, 16 February.

g. Weather.—Since shortly before daylight, 16 February, the weather has been clear.

h. The further development of the situation.—The following items of information are received by G-2, 1st Division, at the division command post in York at the times indicated:

Item 1

Time dated: 7:10 AM Time received: 7:15 AM

From: Air Service

7:00 AM—Large working parties observed on both banks of SOUTH BRANCH CODORUS CREEK in vicinity of CR 443 (395-754). Trees are being felled and numerous trucks are moving to and from the creek in vicinity of bridge.

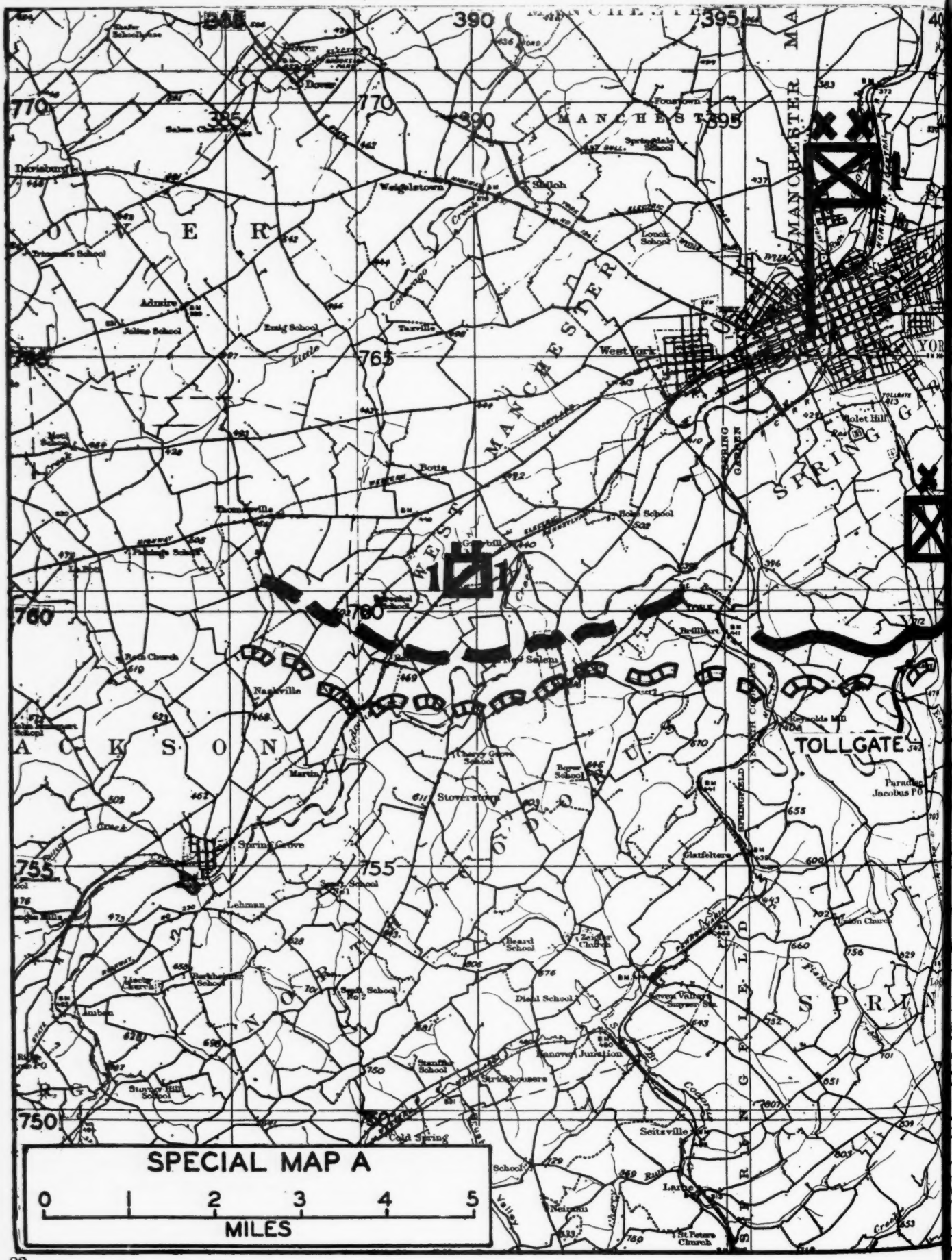
Item 2

Time dated: 7:40 AM Time received: 7:45 AM

From: Air Service

7:20 AM—Nine combat cars, arriving from the direction of RJ 973 (403-745), parked in SHREWSBURY (402-742).

7:30 AM—Several hundred dismounted men and a number of animals and carts observed in draw south of CR 839 (398-749). Three automobiles, leaving this area at 7:30


MANCHESTER
YORK
SPRINGFIELD
TOLLGATE
Weigelstown
Shiloh
West York
Bottis
Nashville
Stoverstown
Spring Grove
Lehman
Seitsville
Cold Spring
Hanover Junction
Glatfelters
Diehl School
Beard School
Locust School
Springdale School
Fourtown
Adnire
Emig School
Taxville
Bolet Hill
Brillhart
Reynolds Mill
Paradise Jacobus PO
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St Peters Church
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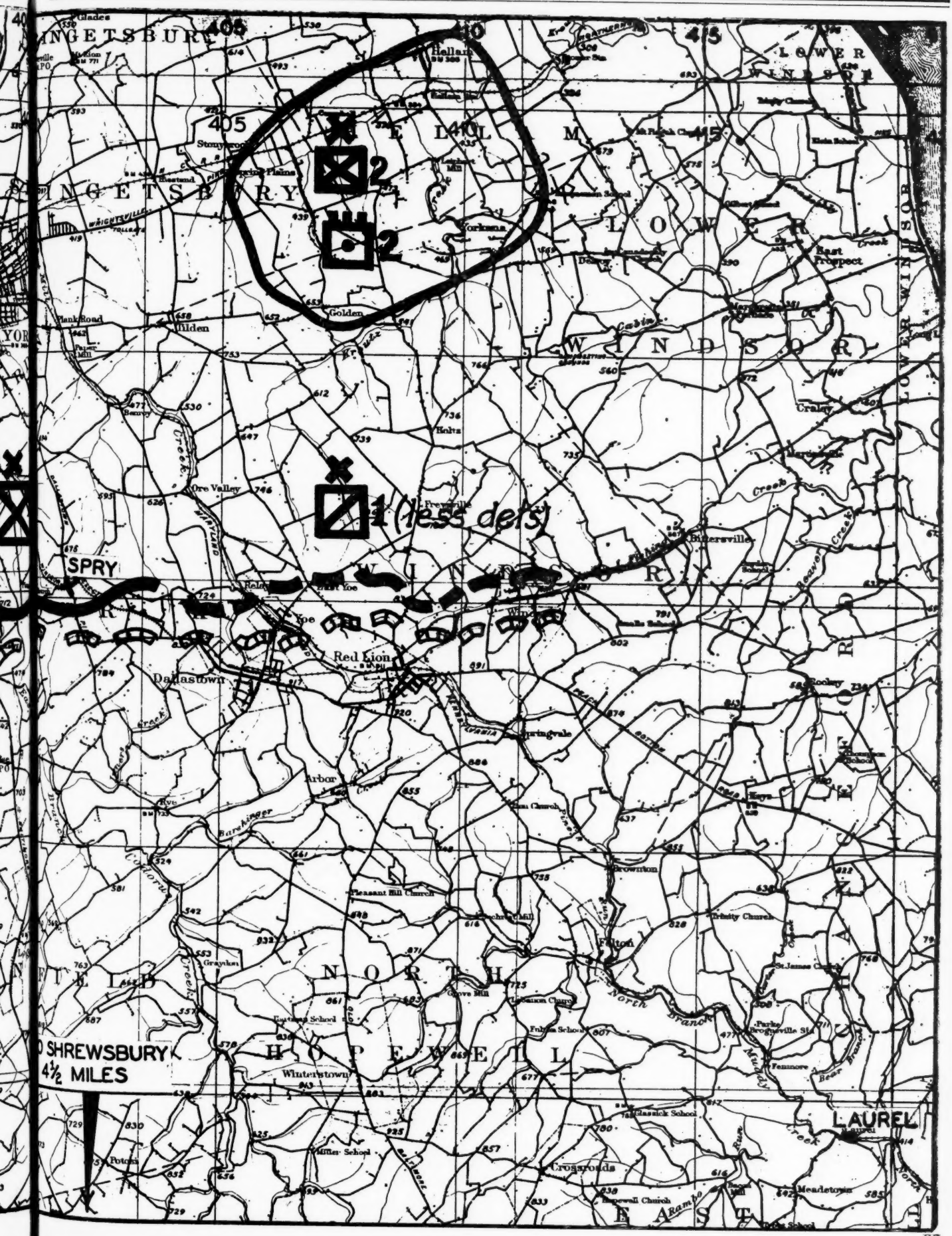
2
2
1 (less det's)
SPRY
Red Lion
Dallastown
Yoe
Arbor
Grayson
Pleasant Hill Church
Trinity Church
Fulton
Grove Hill
Eastern School
Fulton School
Parks Bridgeville Sta
Femmore
Whiterstown
Mattes School
Crossroads
Meadetown
LAUREL
Bittersville
Yorkana
Golden
Hellam
Stony Run
Plank Road
Hilden
Ore Valley
Craley
East Prospect
Brownton
Springvale
Rocky
Cabin
Creek
Run
Branch
North Branch
Bear Branch
Mill
Church
School
WINDSOR
LOWER WINDSOR
NORTH HOPEWELL
EAST
405
415
SHREWSBURY
4½ MILES

AM, traveled northeast via RJ 842 (400-749) and RJ 687 (402-751) and have turned southeast on unimproved road just beyond RJ 662 (403.2-752.1).

Item 3

Time dated: 8:00 AM Time received: 8:10 AM

From: CG, 1st Brigade

As soon as my infantry supporting weapons and our artillery became effective against the hostile resistance on the line: hill north of REYNOLDS MILL (396-757)—TOLLGATE (398-759)—RJ at (402.0-759.3) the Reds withdrew from that line, moving in numerous small groups along the roads and trails toward the south. My assault battalions are pressing forward.

Item 4

Time dated: 8:05 AM Time received: 8:10 AM

From: S-2, 1st Field Artillery Brigade

A battery of medium artillery is firing from a position between RJ 776 (399-750) and the hill one-fourth mile to the north. Batteries of 75-mm guns are firing from the draw at (400.8-751.0) and the draw at (398.0-751.7).

Item 5

Time dated: 2:00 PM, 15 February Time received: 8:30 AM, 16 February

From: CG, Defenses of Washington

Through: CO, 2d Cavalry, Hagerstown, Md

Statements of friendly civilians reaching Washington from Baltimore indicate that an entire Red division marched north from Baltimore during the night 14-15 February.

Item 6

Time dated: 8:30 AM Time received: 8:35 AM

From: Air Service

8:15 AM—Batteries of artillery are firing from the following positions:

Draw south of RJ 829 (398-753)
Draw at (398.0-751.7)
Between RJ 776 (399-750) and the hill ¼ mile to the north
Draw at (400.8-751.0)
Draw ¼ mile southwest of CR 763 (402-752)

8:25 AM—Between 100 and 200 dismounted men are resting in the draw ¼ mile northwest of CR 763 (402-752).

Item 7

Time dated: 9:30 AM Time received: 9:30 AM

Statement of District Superintendent, State Forest Service, York, Pa

"Both South Branch and East Branch Codorus Creek are fordable. North Branch Muddy Creek is fordable above Laurel (418-749). Below Laurel after heavy rains it is unfordable for several days. The area: Felton (413-752)—Keyes (416-756)—Arbor (407-756)—RJ 524 (403-754)—Miller School (406-749) is exceptionally difficult terrain to traverse. It is much more heavily wooded than shown on your maps. After rains the secondary roads are impassable and the numerous small streams are filled with water and exceedingly difficult to cross."

Item 8

Time dated: 9:45 AM Time received: 9:50 AM

From: Air Service

9:25 AM—Eight combat cars, arriving from the direction of MT OLIVET CHURCH (405-744) [4 miles south of WINTERSTOWN (407-750)] parked in SHREWSBURY (402-742).

9:35 AM—Three automobiles are moving about the high ground west of EAST BRANCH CODORUS CREEK, making frequent stops as follows: one on the ridge northwest of CR 557 (404-751); one on the ridge north of RJ 638 (404-750); and one on the ridge east of RJ 638.

Item 9

Record of prisoners at 10:30 AM

Since 7:00 AM prisoners have been captured by the 1st Brigade as follows:

No.	*Organization*	*Where captured*
3	Co C, Red 5th Infantry	CR 408 (396-757)
2	Co A, Red 5th Infantry	At (397.4-757.3)
3	Co B, Red 5th Infantry	RJ 474 (399-758)
3	Co A, Red 6th Infantry	RJ at (400.7-757.5)
4	Co B, Red 6th Infantry	CR at (402.5-757.8)

Several prisoners state that the Red 2d Division and 1st Cavalry Brigade landed in Baltimore prior to dark, 14 February. Some state that the Red 4th Brigade, with a part of the artillery and cavalry, remained in Baltimore on guard duty. Others claim that the entire Red 2d Division marched north during the night, 14-15 February. All complain of a shortage of motor transportation.

Item 10

Time dated: 10:45 AM Time received: 10:55 AM

From: CG, 1st Brigade

After breaking the hostile resistance on the line through TOLLGATE (398-759), my brigade advanced rapidly,

encountering only isolated resistance by small groups which were quickly overcome. By 10:00 AM my leading elements were in contact with a hostile position on the line: CR 443 (395-754)—spur at (398.0-755.3)—hill at (399.9-755.2)—spur at (401.7-754.2)—hill east of RJ 581 (402-754). My advance has been definitely stopped in front of this new position which is intrenched throughout its length and garrisoned in great strength.

A Mr. Reynolds reports that the depth of the water in SOUTH BRANCH CODORUS CREEK immediately south of REYNOLDS MILL (396-757) has decreased rapidly since daylight, which is abnormal in view of the recent heavy rains.

Item 11

Time dated: 10:45 AM Time received: 11:00 AM

From: CG, 1st Cavalry Brigade

After successfully repulsing all attempts by my squadrons to cross the line: RELAY (405-760)—WINDSOR (411-760) prior to 8:00 AM, the Red cavalry suddenly withdrew and retired rapidly to the line: hill ½ mile east of CR 524 (403-754)—RJ 661 (406-754)—PLEASANT HILL CHURCH (407-754)—spur at (414.5-751.3). Batteries of light artillery are firing in support of the hostile cavalry from the following positions:

Draw at (407.2-752.3)
Draw at (408.8-751.9)
RJ at (408.5-750.4)

My advance has been temporarily checked. Two squadrons of the Red 1st Cavalry have been identified on my front.

Item 12

Time dated: 11:00 AM Time received: 11:05 AM

From: Air Service

10:40 AM—SOUTH BRANCH CODORUS CREEK appears to be overflowing its banks and inundating the southwestern section of SEVEN VALLEYS (393-752).

10:45 AM—From fifty to seventy-five men and a few animals and carts observed in area about stream crossing ½ mile southwest of RJ 756 (397-753). Small groups of men moving toward this assembly area from the directions: CR 443 (395-754), RJ 702 (397-754), and BM 782 (399-753).

10:50 AM—Small groups of men moving toward the draw ¼ mile northwest of CR 763 (402-752) from the directions: RJ at (400.1-754.0), RJ at (402.2-754.5), and RJ at (404.2-754.1).

10:55 AM—No changes in positions of artillery as last reported. No movements from draw south of CR 839 (398-749) or from SHREWSBURY (402-742) observed. No additional reserves have been located.

Item 13

Time dated: 10:45 AM Time received: 11:10 AM

From: CO, 1st Squadron, 1st Cavalry

At approximately 8:00 AM the Red cavalry on the west flank unexpectedly withdrew and retired to the line: ridge northeast of LEHMAN (385-754)—spur at (387.6-756.0)—RJ 611 (389-756)—hill at (394.5-754.4). Batteries of light artillery are firing in support of the hostile cavalry from the following positions:

Draw at (388.5-752.7)
RJ at (390.3-753.4)

Two prisoners from Troop E, Red 2d Cavalry were captured near CHERRY GROVE SCHOOL (389-757).

Item 14

Time dated: 11:00 AM Time recieved: 11:15 AM

From: I Corps

Special air missions dispatched to search for undiscovered reserves have observed no indications of Red troops north of BALTIMORE except those previously reported. There have been no troop movements from BALTIMORE today.

Item 15

Time dated: 11:15 AM Time received: 11:15 AM

From: Chief of Staff, 1st Division

The division commander is present at the division command post and desires a new estimate of the enemy situation as soon as practicable.

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3. REQUIREMENT.—The G-2 estimate of the enemy situation at 11:15 AM, in form and content exactly as it would actually be presented to Major General A by G-2, 1st Division.

SECTION II

A Solution

Paragraph
A solution ---------- 4

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4. A SOLUTION.—G-2, 1st Division, presented the following oral G-2 estimate of the enemy situation to Major General A at 11:30 AM, *pointing out the dispositions and activities discussed on the G-2 situation map as the presentation progressed:*

A hostile covering force, estimated to be the 1st Battalion Red 5th Infantry and the 1st Battalion Red 6th Infantry

(less one company) was driven from the line: hill north of Reynolds Mill—Tollgate—road junction at (402.0-759.3) shortly after 7:05 AM. Since 10:00 AM the enemy has definitely stopped the advance of our 1st Brigade in front of an intrenched and strongly garrisoned position on the line: crossroads 443—hill at (399.9-755.2)—hill east of road junction 581. This new position is probably the hostile main line of resistance and appears to be held by at least three battalions.

Four batteries, estimated to be light artillery, are firing from positions in rear of the defensive position as shown on the map. A battery of medium artillery is firing from north of road junction 776. The enemy probably has available to support his defensive position one regiment of light and one battalion of medium artillery.

The two battalions employed as a covering force are apparently assembling as reserves in the vicinity of stream crossing southwest of road junction 756 and in the draw northwest of crossroads 763.

A reserve, probably an infantry battalion, is located in the draw south of crossroads 839. Details from this force have apparently reconnoitered an extension of the hostile east flank along the high ground west of East Branch Codorus Creek as far south as crossroads 594.

The hostile cavalry on both flanks withdrew at approximately 8:00 AM, apparently in conjunction with the withdrawal of the infantry covering force. On the east flank the Red cavalry, supported by three batteries of light artillery, now holds the line: hill ½ mile east of crossroads 524—Pleasant Hill Church—spur at (414.5-751.3) and has temporarily checked the advance of our cavalry. On the west flank the hostile cavalry, supported by two batteries of light artillery holds the line: ridge northeast of Lehman—road junction 611—hill at (394.5-754.4) and appears capable of offering strong resistance.

Since 7:20 AM seventeen combat cars, arriving in two detachments from the northeast, have parked in Shrewsbury. These cars are estimated to be the remaining effective vehicles of the combat-car squadron known to have accompanied the Red cavalry from Baltimore.

The hostile forces in contact are evidently the 3d Brigade of the Red 2d Division, reinforced, and the Red 1st Cavalry Brigade (less one or two squadrons), with a regiment of light artillery and a reduced strength combat-car squadron. Despite statements of Blue civilians and certain Red prisoners to the contrary, these are believed to be the only Red forces north of Baltimore. There have been no known troop movements from Baltimore today and no additional Red troops have been located north of that city.

South Branch Codorus Creek is normally fordable but the enemy has apparently constructed dams in the vicinity of crossroads 443 and there are indications that the stream is flooding to an unfordable stage above the dams. East Branch Codorus Creek is fordable. North Branch Muddy Creek is normally fordable above Laurel. Below Laurel it is probably unfordable. The area: Felton—Keys—Arbor—road junction 524—Miller School is reliably reported as heavily wooded; cut by numerous small streams not easily crossed; and generally difficult to traverse. The hostile defensive position occupies commanding terrain with strong flanks. The difficult streams flanking the hostile position are unfavorable to offensive maneuver by the enemy. The high ground on the general line: Mt Airy School—Mt Olivet Church [4½ miles and 4 miles southeast and south of Winterstown (407-750), respectively] offers the enemy a strong position in event of a hostile withdrawal.

The enemy is capable of:

Defending on his present position, extending his flanks along the strong terrain east of South Branch Codorus Creek and west of East Branch Codorus Creek.

Attacking our 1st Brigade.

Withdrawing either this afternoon or under cover of darkness tonight to a new position on or north of the high ground in the vicinity of the line: Mt Airy School—Mt Olivet Church.

Being reinforced from Baltimore. Troops leaving Baltimore now cannot become effective on or north of the line: Mt Airy School—Mt Olivet Church before late tomorrow afternoon, unless moved by motor transportation. No large group of motor vehicles has been discovered and all Red prisoners complain of a shortage of motor transportation.

It appears relatively more probable that the enemy will continue to defend his present position until darkness tonight.

Red confronts our 1st Brigade with what is believed to be equal infantry strength, disposed on a strong defensive position. Half of his battalions appear to be available to extend his naturally strong flanks. His reserves and his artillery are not well disposed for early offensive action and the terrain occupied by his defensive position is unfavorable to all offensive action except an advance toward the north. With cavalry at least equal to ours in strength covering both of the hostile flanks it is not likely that the enemy's position can be sufficiently threatened to force a withdrawal prior to darkness tonight.

SECTION III

Discussion

	Paragraph
Purpose	5
The G-2 estimate of the enemy situation	6
A solution	7

5. PURPOSE.—This problem illustrates the preparation and presentation of a G-2 estimate of the enemy situation based on information collected, evaluated, and interpreted by a division G-2.

6. THE G-2 ESTIMATE OF THE ENEMY SITUATION.—*a.* The body of the form for a G-2 or S-2 estimate of the enemy situation, as given on page 140, *Combat Orders*, C&GSS, 1938, suggests a convenient and logical sequence that may be followed effectively in presenting orally a G-2 estimate of the enemy situation. The heading and the paragraph and subparagraph captions are superfluous in the oral presentation and should be omitted.

b. A conveninetly located map, on which the current hostile situation and an outline of our own major dispositions have been plotted and to which G-2 can refer while presenting an oral estimate, saves time and is an indispensable aid in depicting the relation of a disposition or activity to the situation as a whole.

c. By means of clear, succinct statements of the enemy activities, identifications, movements, concentrations, and establishments, the estimate should present to the commander a comprehensible picture of the enemy situation at the time it is rendered. Nonessentials waste the commander's time and are likely to prove confusing. They should be painstakingly eliminated from the estimate.

d. While the commander is seldom interested in the details of evaluation and interpretation, the estimate should be so worded as to differentiate unmistakably between established facts about the enemy and the deductions drawn therefrom.

e. The combat efficiency of the regiments and divisions of every army varies materially. The commander's decision may be influenced by the identity of the hostile units confronting him; consequently, the estimate should include such definite identifications as are justified by the information available.

f. The collection of information concerning the terrain is an important responsibility of G-2 and his estimate should contain a brief summary of his conclusions as to the terrain in relation to the hostile situation and the enemy capabilities.

g. Having presented the enemy situation and the terrain as a basis of a study of enemy capabilities, the estimate should next enumerate the plans open to the enemy that may affect the accomplishment of the commander's mission. This list must include every course of action which the enemy is physically capable of employing to interfere with the accomplishment of the commander's mission without regard to G-2's own ideas as to the probability or advisability of their adoption.

h. If the enemy's dispositions definitely favor one or more capabilities and militate against others, such a conclusion should be stated in the estimate.

i. When the known hostile dispositions do not justify the designation of any one plan as relatively more probable of adoption, a statement to that effect should be made.

j. A brief statement justifying the conclusion should follow the designation of any capability as relatively more probable of adoption.

7. A SOLUTION.—*a.* Whenever it is practicable for the division G-2 to present his estimate of the enemy situation to the division commander orally, the oral estimate is preferable to the written, particularly, since any abstruse passages appearing in the oral presentation can be clarified immediately. In this situation, as will usually be the case with the division, time is pressing and the delay incident to the preparation of a formal written estimate is unwarranted.

b. Their early withdrawal supports a conclusion that the Reds in contact with the 1st Brigade at 7:05 AM constituted a covering force.

c. The prisoners taken at numerous points across its entire zone of withdrawal rather definitely fix the strength of the covering force at approximately two battalions. The absence of identifications from Company C, Red 6th Infantry and the presence of between one hundred and two hundred men in the draw northwest of crossroads 763 led G-2 to believe that one company of the enemy's east battalion was not present with the covering force. However, the presence or absence of this one company is not important.

d. The contour of the intrenched position between South Branch Codorous Creek and East Branch Codorus Creek, the strength of its garrison, and the location of the hostile artillery and reserves indicate that this position is the enemy's main line of resistance and such a deduction should be included in the estimate.

e. The extent of the hostile defensive position and the available information of reserves justify an estimate that the defensive position is held by three battalions.

f. Five batteries of artillery have been located, the batteries reported by the air service at 8:30 AM including the three batteries previously reported by the 1st Field Artillery Brigade. The two batteries of artillery firing from positions west of Loganville and the two from positions east of that town indicate two battalion areas. Since one battery in each area has been reported to be 75-mm guns, it is probable that a light regiment is available to support the hostile defensive position. One battalion is the normal medium artillery reinforcement for a brigade. One medium battery has been located. Since it is common practice to withhold the fires of a part of the artillery during the preliminary stages of a defense, it is likely that a medium battalion is present with one of its batteries in concealment.

g. The hostile covering force withdrew in small groups. At approximately 10:45 AM several small groups, coming from the general direction of the front, were approaching the area southwest of road junction 756 and the area northwest of crossroads 763 where some troops, animals, and carts were already assembled. The two areas are suitable locations for regimental reserves. These observations warrant an estimate that the two battalions employed as a covering force are now assembling as reserves.

h. The location and composition of the group observed in the draw south of crossroads 839 indicate a brigade reserve. Since five battalions apparently can be accounted for elsewhere, this group is probably a battalion.

i. The movements of the automobiles reported at 7:40 AM and again at 9:45 AM are interpreted as a reconnaissance for an extension of the enemy's east flank by details from the reserve south of crossroads 839.

j. The sudden departure of the hostile cavalry from positions which it had defended without difficulty during the early hours of the morning indicates a voluntary withdrawal to conform to the changes in the Red infantry dispositions. The Red cavalry must be dislodged from its present strong positions before the Blue infantry can approach the known flanks of the hostile defensive position or any extension of these flanks.

k. Two groups of combat cars, arriving from the direction of the cavalry front, reached Shrewsbury by different routes. The number of cars in each group was approximately three-fourths of the number authorized for a troop. The combat-car squadron which accompanied the Red cavalry is known to have suffered heavy losses in recent actions. These observations are the basis of G-2's estimate that the Shrewsbury cars are the remaining serviceable vehicles of the combat-car squadron which left Baltimore with the Red cavalry.

l. In estimating the strength of the Reds confronting the 1st Division, G-2 credits the aerial observations made

during the advance of the Red columns from Baltimore and the negative reports from the intensive reconnaissances conducted by the division and corps air services this morning. He rejects the statements of frightened civilians, fleeing from Baltimore, and the conflicting stories of Red prisoners who may be deliberately lying or grossly ignorant of the froces engaged about them.

m. The work in progress near crossroads 443, the decreasing depth of water immediately south of Reynolds Mill, and the inundations at Seven Valleys support a conclusion that the enemy is flooding the valley of South Branch Codorus Creek by means of dams.

n. The District Superintendent, State Forest Service, is a Blue state government official; should be thoroughly familiar with the area discussed; and may be assumed to be qualified to judge the matters set forth in his statement. His description of the terrain is accepted as reliable.

o. All enemy capabilities listed, except a withdrawal, are apparent. It may be argued that Major General A has accomplished his mission if Red withdraws. A withdrawal will free York from any immediate hostile threat but since the 1st Division may have to contend against superior Red forces before Blue reinforcements can arrive, the security of York will be facilitated by gaining sufficient distance toward the south to accommodate a limited delaying action or at least a highly flexible defense.

p. The solution presented in paragraph 4, Section II, includes a statement justifying the conclusion that it is relatively more probable that Red will defend his present position, at least until dark tonight.

"Recent conflicts in Europe, the Far East and Africa bear witness to the fact that the individual soldier remains the controlling factor. The tactics of the future intensify, rather than diminish, the necessity for high qualities of individual leadership. The object of developing aviation, motorization and mechanization is to attain the highest possible degree of mobility."—(From President Roosevelt's address at the graduation exercises of the U. S. Military Academy, 12 June, 1939.)

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Included in this directory are only those periodicals from which articles have been selected. See also, "List of Periodicals Indexed and Key to Abbreviations."

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Catalog of Selected Periodical Articles

This section catalogs the articles selected from Library periodicals for the current quarter. Periodicals in this Catalog are arranged alphabetically.

ARMY ORDNANCE

July-August 1939

PRODUCTION IS PREPAREDNESS. MILITARY SUPPLY RESTS UPON THE INDIVIDUAL MANUFACTURING PLANT. Colonel Burns

SPRINGFIELD ARMS. MILESTONES OF A GREAT NATIONAL ARMORY. Captain Miller

THE ANTITANK GUN. THE 37-MM HIGH VELOCITY WEAPON NOW USED BY OUR ARMY. Lieut.Colonel Barnes

WHY A RAW MATERIALS RESERVE? OUR STOCK PILE SHORTAGES ARE STRATEGIC AND CRITICAL. Captain Heiss

ARMY QUARTERLY (Great Britain)

July 1939

"OUR NATIONAL CHARACTERISTICS ARE MORE FAVOURABLE TO A PROCESS OF EVOLUTION THAN TO REVOLUTIONARY CHANGES. EVOLUTION TOWARDS CLOSER COORDINATION BETWEEN THE THREE SERVICES IN PEACE AND CLOSER COOPERATION IN WAR HAS MADE APPRECIABLE PROGRESS SINCE 1918.

"TRACE THE PROGRESS OF THESE DEVELOPMENTS UP TO DATE AND DISCUSS WHAT SHOULD BE THE GOAL AT WHICH EVOLUTION SHOULD AIM AND BY WHAT STEPS THIS GOAL SHOULD BE APPROACHED." Major Barclay [Military Prize Essay, 1939]

THE WOTAN POSITION. Captain Wynne

BULLETIN BELGE DES SCIENCES MILITAIRES (Belgium)

BY CAPTAIN W.E. LORENCE, Corps of Engineers

January 1939

THE WAR OF 1914-1918 ON THE RUSSIAN FRONT. WAR EXPERIENCES OF AN ARTILLERY OFFICER OF THE IMPERIAL RUSSIAN ARMY.
[La guerre 1914-1918 sur le front russe. Souvenirs de campagne d'un officier de l'armée impériale russe.] (IV) Lieutenant Jusret

The final instalment of the war experiences of Captain Koukhareritch, an artillery officer of the Imperial Russian Army during the World War. He discusses his personal experiences on the Riga front and in Rumania.

EIGHTEEN MONTHS OF WAR IN CHINA (1937-1938).
[Dix-huit mois de guerre en Chine (1937-1938).] (I) Captain Materne

The first instalment gives a concise description of the forces engaged, the conquest of the northern provinces (July-November 1937), the battle of Shanghai (August-December 1937), the air activities, and the battle for the Lunghai railroad (February-June 1938).

The battle of Shanghai (August-December 1937) was stubbornly fought with unexpected skill by the Chinese.

The battle for the Lunghai railroad gives a good description of the difficulty of the Chinese line of communications. During this period, on 22

March, 1938, the Chinese launched their first offensive since the war began, and won their first victory. They attacked near Suchow (Hsutschau) and cut off four Japanese divisions inflicting severe losses. For the first time since the war, the Chinese bulletins of Marshal Chiang Kai-Shek was able to accounce a victory; for the first time Japanese troops had been defeated. However, Japanese reinforcements arrived in April 1938 and in May Suchow was again attacked by the Japanese. On 22 May, 1938, the Japanese organized the pursuit and by 5 June, 1938, the Chinese were forced to prepare positions at Tschungmu, about 186 miles west of Suchow; the Japanese taking Kaifeng.

The inundation created by the destruction of the levee on the Hoangho (Jaune) River between Tschengtschau and Kaifeng flooded hundreds of Chinese villages and destroyed the supplies and equipment of many Chinese and Japanese divisions. Each side accused the other of causing the inundation. However, the net result was that the Chinese army was able to reorganize in good order behind the inundations of the Hoangho.

The scarcity of munitions and modern equipment in the Chinese army appears to favor the Japanese columns; but the author feels that Marshal Chiang Kai-Shek can carry out the wearing down process for a much longer period, and that these operations do not necessarily mean that the Japanese will be successful in the long run.

THE ECONOMIC AND FINANCIAL ORGANIZATION OF ELECTRICAL POWER IN BELGIUM.
[L'Electricité en Belgique. Organisation économique et financière.] Lieutenant Michel

Extracts from the book of the author who, besides being a reserve lieutenant, is a highly qualified electrical expert. Belgium is now one of the most highly electrified countries in Europe and the author describes the wide distribution of electrical power in the kingdom. Figures and diagrams show the annual output from 1914 to 1935, the power installed in each of the provinces, the location of central generating stations, and the high tension transmission lines.

February 1939

MY SECOND MISSION IN RUSSIA DURING THE WORLD WAR.
[Ma deuxième mission en Russie pendant la Guerre.] Lieut.General Semet

A description of General Semet's first mission is contained in the September, 1938 issue of the Bulletin Belge, which was reviewed in the March 1939 Quarterly.

Late in December 1915, while serving as chief of staff of the Belgian Cavalry Corps, the author was appointed to the command of the Belgian motorized machine-gun corps which had been placed at the disposal of the Russian Army.

The corps consisted of two batteries of armored cars, twelve armored vehicles in all, armed with 37-mm cannon and machine guns. It also included a cyclist company, one repair battery, one supply battery and a dozen motorcycles. A remarkable organization for the World War period.

The author joined his machine-gun corps at Zbaraz where it was attached to the VI Corps, commanded by General Goutor. The problem of employing such a unit was a difficult one when we consider that it had to be employed with an army whose language, machinery and methods of combat differed so radically from that of the Western Front, especially in view of the fact that such a unit had never before appeared on a battlefield. Happily, General Goutor was a distinguished officer who spoke French, having attended l'Ecole Supérieure de Guerre at Paris and who had made a brilliant record in the Russo-Japanese War.

After long conversations the General and the author decided to use this new type of unit as follows: the two armored car batteries were to be attached, one each, to the 4th and 16th Divisions of the VI Corps; the batteries to support the attack of the assault battalions, and if possible, to precede the Russian infantry until stopped by the Austrian trenches. To avoid delay, they were to move by hard surfaced roads, cleared by Russian engineers, as long as possible prior to the jump-off. In order to provide mutual support cars were to advance in pairs. The cyclist company was to work with the Cossack Cavalry Regiment of the VI Corps.

The Belgium machine-gun corps participated in the Brussiloff offensive of June, 1916, in which the VI Corps bore a prominent part. The procedure outlined above was followed and by their speed, mobility and fire power, the armored cars greatly assisted the assault of the VI Corps by blotting out the Austrian machine guns which had escaped the Russian artillery fire. The services rendered gained them two citations.

Unfortunately, signs of the revolution soon afterwards appeared in the Russian armies, causing a rapid break-up of the armies. The author applied for a return to the Yser front and the units of the Belgian Corps followed later via the roundabout route through Siberia and America.

EIGHTEEN MONTHS OF WAR IN CHINA (1937-1938).
[Dix huit mois de guerre en Chine (1937-1938).] (II) Captain Materne

The second instalment carries the narrative of events from the inundation of June 1938, which held the Japanese at Kaifeng, to the fall of Hankow, 24 October 1938.

In spite of the heavy losses around Shanghai and Nanking, Chinese resistance had stiffened. Two reasons for this were the wave of national spirit and the decree of compulsory military service. Two hundred regular divisions were organized and trained in Western China, which was still in contact with the outside world. Officers in every Chinese division were especially trained in guerrilla warfare. These officers then penetrated the Japanese lines, spread among the villages and organized guerrilla bands to the continued harassment of the Japanese.

The capture of Matung (20 June-5 July 1938), the battle of Kiukiang (20 July-20 September 1938), and the capture of Hankow (24 October 1938) by the Japanese forces are well narrated.

THE BASIS FOR A NATIONAL POLICY ON MOTOR FUELS.
[Les bases d'une politique nationale des carburants.] Captain Crahay

The importance of insuring an adequate supply of motor fuels in time of war is as great as the procurement of personnel or munitions. The author reviews the various methods in use or being tried out throughout the world. He calls attention to the extensive coal fields in Belgium and the developments in the exploitation of oil from coal, and urges that the Government adopt a more active policy in developing its natural resources in order to insure an adequate supply of motor fuels for use in time of war.

A COMPARISON OF COMBATANT PERSONALITIES.
[La différenciation du caractère chez le combattant.] Lieutenant Cornet

The author presents a psychological study of the present-day soldier based on researches of the German Ministry of War. War machinery has become more precise and deadly, and greater demands must be made of the present-day soldier into whose hands are placed these complicated mechanical contrivances. We can no longer consider the soldier only as one of a group, but must also study him as an individual. After discussing the influence of race, nationality and profession or trade on the human character as well as the conduct of the individual in combat, the author then examines the role played by the different types of human beings. He divides individuals into two types, those who look upon war as a form of life (the warlike type), and those who see in war a constraint or an obligation. The author then compares the German study with the peasant-soldiers and the artisan soldier of France and states that studies should be continued in order to determine the best utilization of each type in modern war.

March 1939

ANNUAL MEETING OF THE ROYAL MILITARY SCHOOL, 17 DECEMBER 1938.
[Séance académique de l'Ecole Royale Militaire (17 décembre 1938).]

Opening address by the Commandant, General Nyssens, at the annual meeting of the Royal Military School.

The commandant, among other things, states that the army of a small country like Belgium is always exposed to attack by superior forces. Such forces must be balanced by such factors of military power as organization, armament and matériel, bravery of the troops and instruction of officer personnel. Of these factors the last, namely, instruction of officer personnel, is the most important.

In the conduct of military operations, decisive success can only be obtained by employing the element of surprise. To surprise an adversary, we must attack at a time when he least expects, and at a place where he believes himself least menaced. To conceive such a maneuver and to realize surprise requires initiative and imagination; and the best aid in developing these two qualities is the study of military history.

The commandant's address is followed by a lecture on chemical synthesis by Professor (Reserve Major of Engineers) Christens.

EIGHTEEN MONTHS OF WAR IN CHINA (1937-1938).
[Dix-huit mois de guerre en Chine (1937-1938).] (III) Captain Materne

The third instalment discusses the air operations and the Russo-Japanese affair at Changkufeng (11 July-11 August 1938).

Based on Soviet information, the author estimated that the Japanese began the war with 1,300 airplanes (400 fighters, 700 pursuit and 200 reconnaissance planes). The Chinese had approximately 900 planes. Japanese combat aviation was employed principally against Chinese airdromes, railways, river transport, troops on the march and in concentration areas, and the large towns of political and economic importance. At the beginning of hostilities, Japanese planes attacked at altitudes from 100 to 600 yards. However, heavy losses soon forced them higher and also to attack pursuit. Bombardment operated from 2,000 to 3,000 yards altitude. The toll of airdromes and the large towns was heavy. Bombardment always carried a certain proportion of incendiary bombs. However, damages to railways was not very great. The Chinese, by keeping materials close at hand, effected railway repair rapidly.

Neither Russia nor Japan intended the frontier affair at Changkufeng (11 July-11 August 1938) to develop into general hostilities. However, what began as an outpost incident soon grew to considerable proportions, until a division was involved on each side. The Russians, driven off the disputed hill by the Japanese, returned greatly reinforced and attacked. The Japanese likewise were reinforced, and succeeded in holding their positions. When the fire died out the casualties amounted to 900 Japanese and 1,700 Russians killed and wounded. The chief result of the affair was that Japan now has to keep a large force on the Manchurian border as the price of eternal vigilance in order to watch the Soviet menace.

CANADIAN DEFENCE QUARTERLY (Canada)

July 1939

T. E. LAWRENCE. By Lord Tweedsmuir
THE ATTACK. Captain Simmonds
SOME PROBLEMS OF TODAY. By the Honorable Cordell Hull
ANGLO-AMERICAN RELATIONS. By the Marquess of Lothian
THE PROBLEM OF TUNISIA. Lieut.Colonel Steele
THE SINO-JAPANESE CONFLICT. Colonel Nikolaieff

CAVALRY JOURNAL

March-April 1939

NEGLECTED MOBILITY. THE CORPS CONNEAU AT THE MARNE, SEPTEMBER, 1914. Lieut.Colonel Schwien
REVISED TABLES OF ORGANIZATION
GENERAL HAWKINS' NOTES: THE SUPPORT OF CAVALRY BY MOTORIZED INFANTRY

May-June 1939

THE FUTURE OF AMERICAN CAVALRY. George F. Eliot
NEW DEVELOPMENTS IN THE ORGANIZATION AND EQUIPMENT OF CAVALRY. Lieut.Colonel Grow
CANNAE: THE PERFECT BATTLE. Chaplain Wilcox

CAVALRY JOURNAL (Great Britain)

July 1939

THE ODYSSEY OF A CAVALRY OFFICER. Lieut.Colonel Beaman
THE INFANTRY NEEDS A BATTLESHIP. Lieutenant Wilmeth

CHEMICAL WARFARE BULLETIN

July 1939

FIGHTING A CHEMICAL PLATOON. Lieut.Colonel Williams

COAST ARTILLERY JOURNAL

May-June 1939

THE GLORY OF THE SOLDIER. A DISCIPLINE OF CHARACTER IS THE ONLY DISCIPLINE THAT WILL STAND THE STRAIN OF WAR. Major Phillips
HARBOR DEFENSES AND NAVAL STRATEGY. Major Milburn
BONAPARTE IN ITALY. PART III. Fletcher Pratt

July-August 1939

CHEMICALS AND COAST DEFENSE. Lieut.Colonel Prentiss
A NEW PHASE IN CHINA. Lieutenant Rudolph
WAR IN A MECHANISTIC CIVILIZATION. Major Connolly
MUTINY OR A BOUNTY? Major Elliott
ANTIAIRCRAFT PREPAREDNESS. Captain Lovell

FIELD ARTILLERY JOURNAL

May-June 1939

THE AUTOGIRO — AN OBSERVATION POST. Captain Ely
THE MILITARY ORGANIZATION OF YUGOSLAVIA. Captain Gordon-Smith, Royal Yugoslav Army

FIGHTING FORCES (Great Britain)

June 1939

BURMA AND THE SINO-JAPANESE CONFLICT. By "Macduff"
OFFENSIVE THOUGHTS. By "Onlooker"

LA FRANCE MILITAIRE (France)

BY MAJOR T.K. PHILLIPS, Coast Artillery Corps

15 December 1938

THE DEATH OF A PROPHET.
[La mort d'un prophéte.] Colonel Lebaud

The passing of Lieut.Colonel Emile Mayer — who consecrated 60 years of a long life (he died 27 November 1938, at the age of 87) fighting for national defense through the publication of many books and articles — will not go unnoticed in the military world.

Of prodigious intellectual activity, with sparkling spirit and good humor, welcoming original and even daring ideas, he tackled the most diverse military subjects with equal mastery and complete absence of dogmatism.

He was one of those — so rare, alas — who, long before the war, protested against the official theory of the headlong offensive. Moved by rare intuition, he published a prophetic article in the "Revue Militaire Suisse," in 1902, on the form of future war. The following characteristic passage is extracted:

"Such is the nature that should be attributed to the defensive battle of the future. It can be represented by placing two walls face to face almost in contact with each other, separated only by the thickness of peril, and this double wall will remain almost inert in spite of the will to advance on the part of one or the other, in spite of the efforts made to succeed.

"One of these lines, unable to penetrate the other, will seek to envelop him. The latter, in turn, will prolong his front and it will be a race to see who can extend the fastest as far as means will permit. Or, at least, that is what would happen if the opponents could develop indefinitely. But nature presents obstacles. The line will stop at a barrier, a sea, a mountain, the border of a neutral nation."

Was not that a prophetic vision? And should not the man whose mind was so luminous be preserved from forgetfulness?

* * * * * * *

The readers of "The Command and General Staff School Military Review" will remember the many articles by Colonel Mayer digested from the "Revue Militaire Suisse." The most recent, on page 46 of the September, 1938, issue, contains Colonel Mayer's own story of his efforts to educate his friends Foch and Joffre toward his point of view. In this article he said: "I never attempted to inculcate my friends Joffre and Foch with my ideas, but simply to broaden theirs. Both had a precise idea of how the war would be fought, and I told them they were wrong to represent it to themselves a priori and that the future would give the lie to their previsions. Above all, I thought they deceived themselves in placing their confidence in the headlong offensive. I wrote in 'L'Opinion' in May, 1939: 'I believe that this theory is false. I believe it even more dangerous than false.' [May I not be permitted to say that these two lines are those I am most proud to have written?]"

One wonders who are the prophets of today who cannot make themselves heard against the official doctrines. And what soldier now cannot be benefitted by heeding Colonel Mayer's advice to keep an open mind about the character of the next war. The soldiers of the entire world will join their brothers in arms in France in their regret for the loss of a great mind and a great character.

INFANTRY JOURNAL

May-June 1939

THE GLORY OF THE SOLDIER. Major Phillips
GERMANY'S TACTICAL DOCTRINE. Captain Hartness
THE CAMPAIGN OF PERSISTENCE: BONAPARTE IN ITALY. (III) Pratt

July-August 1939

WAR IN A MECHANISTIC CIVILIZATION. Major Connolly
MUTINY OR A BOUNTY? Major Elliott
A NEW PHASE IN CHINA. Lieutenant Rudolph
PLACE OF THE MODIFIED BAR IN ORGANIZATION. Colonel Fredendall
CHEMICAL SUPPORT OF INFANTRY. Lieut.Colonel Prentiss
BLOCK THOSE ROADS. Major Heavey
FIELD MARSHAL ECONOMICS. Dr. Sternberg
JAPANESE INFANTRY PLATOON. Captain Booth
MODERN MILITARY TERMINOLOGY. By "Davus"
TOMORROW'S TROOP CARRIER? Sergeant Bull

JOURNAL OF THE ROYAL ARMY MEDICAL CORPS (Great Britain)

May 1939

THE MEDICAL ORGANIZATION OF THE SHANGHAI EMERGENCY, 1937. Major Tibbs
SHANGHAI EMERGENCY, 1937. Lieut.Colonel Galloway

June 1939

MECHANIZATION AND THE MODERN FIELD AMBULANCE. Lieut.Colonel Dowse

JOURNAL OF THE ROYAL ARTILLERY (Great Britain)

July 1939

"THE BATTLEFIELD OF THE FUTURE SHOULD PRESENT GREAT POSSIBILITIES FOR THE EMPLOYMENT OF ARTILLERY FIRE OBSERVED FROM THE AIR, BOTH AGAINST STATIONARY TARGETS SUCH AS THE ENEMY'S ARTILLERY AND MOVING TARGETS, SUCH AS RESERVES OF MECHANISED TROOPS.

"DO OUR PRESENT METHODS TAKE FULL ADVANTAGE OF THESE POSSIBILITIES, AND IF NOT WHAT STEPS DO YOU SUGGEST MIGHT BE TAKEN TO IMPROVE THEM?" Major Hilton ["Duncan" Silver Medal Essay — 1938-39.]

ANTI-AIRCRAFT "LAY-OUTS" FOR THE DEFENCE OF VULNERABLE AREAS. Colonel Shilstone

THE PRESENT STATE OF COAST DEFENCE. (Translation) Major Johnston

JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION (Great Britain)

May 1939

THE PSYCHOLOGICAL EFFECTS OF BOMBING. Dr. Strauss
THE ARMY'S NEW WEAPONS AND EQUIPMENT. Lieut.Colonel Armstrong

BLOCKADE IN THE GREAT WAR. Lieut.Colonel Duckworth
THE JAPANESE CAMPAIGN IN CHINA. Peter Fleming

JOURNAL OF THE UNITED SERVICE INSTITUTION OF INDIA

(Great Britain — India)

April 1939

"A NATION'S FIGHTING POWER IS NOT NOW MERELY GAUGED BY ITS ARMED FIGHTING STRENGTH, BUT ALSO BY ITS PRODUCTIVE STRENGTH." Major Holworthy [Gold Medal Prize Essay, 1938]

MECHANISATION OR MOTORISATION. THE APPLICATION OF MOBILITY TO OUR FRONTIER PROBLEMS. By "Vibgyor"

KRASNAYA ZVYEZDA (Russia)

BY LIEUTENANT JOSEPH DASHER, Military Intelligence-Reserve

23 March 1939

TRAINING THE SOLDIER TO FIRE AT TARGETS IN THE AIR.
[Obuchenye Boytsa Strelbe po Vozdushnim Tselyam.] Major I. Lidin

In instructing the soldier to fire at an aerial target, there should take place some preparatory training, during which he would be taught about the combat mission of the air force, aerial landing parties, parachute troops, and tactics employed by the air force in combat against land forces. The soldier must be able to distinguish friendly planes from those of the enemy, and must be able to fire at enemy aircraft in different situations.

24 March 1939

DIRECTING ACTION DURING NIGHT COMBAT.
[Upravlenye v Nochnom Boyu.] Captain E. Pereverzev

Directing action during night combat involves certain rather complicated problems because of difficulty in orientation, limitations in the use of artillery, difficulty of concealing sound and light. According to Captain Pereverzev, the quintessence of a night attack are the bayonet and the hand grenade. The battalion approaches as closely as possible to the enemy's front line of resistance and strikes suddenly. All intervals and distances are reduced for night combat. The sector of action of the first battalion will be, for example, 300-400 yards, and the interval between companies of the first echelon, about 40-50 yards. At times, when the night is very dark, there will be no interval at all. The company of the second echelon also follows at reduced distance. Its mission is determined while combat is in progress, depending on the flank which might require assistance.

The battalion commander and his staff proceed between the first and second echelons.

If the front line of resistance is successfully broken through, the company radio apparatus should be extensively used for communication. Light signals also will be of service.

The first line of enemy trenches should not be occupied either at night or in the daytime, because the enemy will invariably have them well covered by fire. As the forward movement progresses, trenches may be occupied, because in this situation the enemy will hardly risk firing, not knowing which trenches are his.

26 March 1939

COOPERATION IN COMBAT.
[Vzaimodeystvye v Boyu.] Colonel F. Malyarov

A study of combat problems arising from joint action by artillery and infantry, supported by tanks, directed against antitank defense.

28 March 1939

EXPERIENCE IN THE COMBAT TRAINING OF TANK CREWS.
[Opit ognevovo obuchenya tankistov.] Major P. Drozdov

An outline of training methods employed by the author in instructing his command.

1 April 1939

ROADS IN OFFENSIVE OPERATION.
[Dorogi v Nastupatelnoy Operatsii.] Division Commander D. Karbishev

That the Soviet Union is taking energetic steps toward remedying the proverbial lack of good highways in the U.S.S.R., is clearly evident from this article, whose author holds the rank of Major-General of the Red Army, and whose opinion should thus be regarded authoritative. He points out, that along with increased use of mobile units, such as motomechanized forces and cavalry, there will be an equal increase in problems created by the placing of obstructions and obstacles along highways. Thus, in order to insure the maneuverability of such mobile forces, there will arise increased need of pioneer and engineer units, which, in turn, should be motorized. Attached to these units should be special chemical detachments trained in decontaminating work. There should be special instruction in locating concealed slow action mines and other explosives. Bridge building and repair should also receive the careful attention it merits, especially in view of heavy weight of modern technical equipment.

3 April 1939

RECONNAISSANCE IN THE MOUNTAINS.
[Razvedka v Gorakh.] P. Ogin and D. Medvedovskiy

An interesting feature of a mountain reconnaissance test, conducted by a Red Army unit in Central Asia, was the lower accuracy of rifle fire, caused by the altitude. The test served to stress the necessity of preliminary training of mountain reconnaissance parties in mountain climbing and the use of mountain climbing tools, geological formations of the terrain, etc.

4 April 1939

NEW FIELD REGULATIONS OF THE JAPANESE ARMY.
[Noviy Polevoy Ustav Yaponskoy Armii.] N. Kozlov

The new 1938 Japanese Field Regulations consist of the 1924 Regulations, less the section on organization of the rear, and of the 1929 Regulations.

Worthy of attention is the great care with which even small details are developed. For instance, such matters are foreseen as norms of laying cable, or how message centers are to be operated, and who, when and how many use the telegraph and telephone.

At the same time there is a conspicuous absence of any norms on the basic combat questions. There are no figures governing the area of sectors in offensive combat, distances for reconnaissance parties and the rear guard in defensive combat. Only the general principles of important problems of combat are presented. There are no directions for using them in practice, and the commander is left to make his own decisions.

Evident is the Japanese experience in China, as well as the experiences of Japan's "triangle" friends, Germany and Italy. The chapter dealing with the march has been materially complemented. According to the new regulations, large columns are subdivided into several echelons, when strongly threatened by enemy aviation, motomechanized forces, and especially by tank units. Provisions are made for facilitating antiaircraft and antichemical defense during the march. Eventuality of the sudden attack is foreseen.

As to tanks, the regulations recommend their employment mainly along the main axis of attack. At "convenient moments," powerful tank assaults should be executed for the purpose of capturing the most important points, to create disorder in the enemy's deploying operations, and for sudden attacks on his artillery and staff posts.

In offensive combat tanks may be used thus: if there are few supporting tanks, they are distributed between units for direct support of infantry. If, on the other hand, there are many supporting tanks, some of them will be used to form a tank group for action against distant objectives, and this group will be given a separate sector of operations. Its purpose will be to destroy the enemy artillery, staff posts, and reserves.

According to the new regulations, tanks should be used above all for destruction of enemy tanks. Since during the war in China there were no occasions when tanks fought against tanks, it is presumed that this is intended in the event of war against the U.S.S.R.

The chapter on tactics of frontal offensive combat has been enlarged. Recommendation is made for directing the main axis of frontal attack against sectors occupied by weaker enemy units. The depth organization is increased. Judging from tactical problems studied by the Japanese Army, the width of the area of a division acting in the direction of the main axis of attack, will be equal to 1-1½ miles.

The part played by aviation in offensive combat is pictured as follows: early in the battle the air force fights against enemy artillery, his strong defensive points, against ranks, and in cooperation with the first line of attack. Later, the air force aids land forces in developing the latter's successful operations against the enemy's second line, his motomechanized units, and it attacks important points on his communication lines.

The reconnaissance mission of the aviation has not been neglected.

At times the air force may be called upon to substitute for artillery in aerial bombardment, especially where the terrain interferes with the movement of artillery and tanks. Transport aviation will be used for delivery of ammunition and supplies.

Special emphasis is laid on "surrounding and destroying" the enemy, and this phrase is frequently repeated throughout the manual.

The principal area of defense forms the basis of defensive action. It consists of a line of infantry defense, positions of principal artillery forces, reserves, and various engineering features. There are no specific norms in this regard, but Japanese textbooks on tactics state that a division will occupy a sector 4½-7 miles wide, and 2-3 miles in depth; a brigade, 3-3½ miles wide and 1½ miles in depth; a regiment, 1½-2 miles wide, and 1½ miles in depth.

Obstacles are erected in front and inside of main line of resistance. There will be many sham constructions.

Antitank defense consists of combining natural and artificial obstacles with antitank fire. Antitank mine fields will be carefully camouflaged. Large size hand grenades, several hand grenades tied together, and antitank mines will be used against tanks. Specially trained units will concentrate on hand grenade throwing.

The chapter on river crossing has been elaborated.

Precise instructions are given on methods of communication between infantry, tanks and artillery.

5 April 1939

THE BOMBER IN NIGHT FLIGHT.
[Nochnoy Polet Bombardirovshchika.] Major O. Borovkov

A discussion of advantages and disadvantages of nocturnal aerial bombing expeditions.

10 April 1939

THE MARCH IN ANTICIPATION OF COUNTERATTACK.
[Marsh v Predvidyenii Vstryechnovo Boya.] Brigade Commander G. Dyakov

The growth of technical equipment of modern army units, and the sharp increase in the depth organization, has created new problems in deploying operations. The old Russian World War infantry division, consisting of

four regiments, was 7 miles in road length, and required 3-3½ hours for deploying. The modern (Soviet) rifle division is 18½ miles in road length, and takes not less than 7½ hours for deploying.

The author recommends wide use of night marches, which enables the reduction of the length of the column, and offers opportunities for sudden attack.

THE CHEMICAL TRAINING OF A FIGHTER.
[Khimicheskaya Podgotovka Boytsa.] Major V. Denisov

A discussion of various problems of training against chemical attacks.

11 April 1939

MILITARY EXPENDITURES OF GERMAN FASCISM.
[Voyenniye Raskhody Germanskovo Fashizma.] S. Vishnev

According to the London "Economist," German military expenditures have grown from 2.8 billion marks in 1933 to 22 billion marks in 1938. At the same time, this British source estimates that the 1938 German military expenditures were 15 times greater than in the pre-war year of 1913.

Reviewing the various economic factors controlling the German situation, the "Economist" arrives at the conclusion that Germany can utilize three methods in order to continue the financing of present armaments program, to wit: unlimited emission of paper money, leading to violent increase in prices; further increase of already exorbitant tax rates and the reduction of wages, and, finally, preservation of nominal wage rate and introduction of a card system of distribution for foodstuffs and articles of necessity. The "Economist" concludes that all these methods lead to still greater decline of the German living standard.

16 April 1939

DEFENSE IN THE JAPANESE ARMY.
[Oborona v Yaponskoy Armii.] A. Shchedrov

The new Japanese field regulations, published in 1938, define the mission of defense as consisting of the problem of destroying superior forces of the attacker. Relying upon the support of the so-called main defensive zone, and exploiting the terrain advantages, various constructions erected by the engineers, and its own combat preparedness, the defending side must defeat the advancing enemy before he reaches the first line of resistance, and must finish him with counterattacks. Regulations demand that the defense be active, and that this activity be planned in advance.

The defense consists of advance units, a covering force, and the main zone of defense. At times, advanced positions, or rather "positions placed to the fore," are organized in front of the main zone of defense.

Most frequently it is cavalry, strengthened by infantry and other arms, which is detailed for the advance force. The sending out of infantry units for this mission is also practiced. The advance force is instructed to conduct reconnaissance, to defend important points and to delay the enemy's forward movement. Engineering units are detailed to the advance force, when needed.

The covering force is dispatched from the defense sector to a point indicated by the division commander. At times the division commander personally directs the action of the covering force.

The strength of the covering force depends upon circumstances. One battalion of infantry, reinforced by 1-2 batteries, may be designated as the covering force for a brigade defensive sector.

Distance separating the covering force from the front line of resistance depends upon its support in combat with the advancing enemy. As a rule, the covering force is not sent further away than 1½ miles. In individual instances, when it is intended to mislead the enemy through the location of the covering force, the latter may be sent forward to a distance exceeding 1½ miles. Cases are known where covering forces have been sent as far forward as 3½-4½ miles.

The mission of the covering force is summed up thus: reconnaissance, covering of own defensive zone, and delaying the enemy's advance.

Advanced positions are organized for the purpose of temporary retention of important points in the forward part of the main defensive zone, to mislead the enemy in his effort to determine the location of the front line of resistance, and in order to render his movements more difficult.

The composition, strength and distances of the advanced positions are not regulated. In practice they are used very rarely, and mostly in the zone between the front line of resistance and the covering force. Their location in front of the covering line is not excluded.

The main defensive zone consists of a sector of infantry resistance, positions of the main artillery forces, reserves, and various engineering constructions. For convenience of command the main defensive zone is divided into defensive sectors, which include the right flank and the left flank units.

The sector of infantry resistance is occupied by infantry battalions, whose positions are organized on the principle of circular defense. In depth, the sector of infantry resistance measures 700-1,000 yards. The front of battalion defense ½-¾ miles.

Fire system is organized by infantry battalions according to local conditions. A part of the infantry is designated for firing at longer distances, to about 1,500 yards, on the average.

All supporting artillery is located within the infantry defensive sector and is used to suppress the enemy's supporting artillery and machine guns. When necessary the supporting artillery will be used for antitank defense. For this latter purpose strong points are created. Guns designated for antitank defense will be placed in several reserve positions. In addition to this, artificial antitank obstacles will be constructed, such as ditches, scarps, cleats, and mine fields.

The basic mass of the artillery in defense is used in centralized manner. In individual cases, for instance on broken terrain, or on a wide front, part of the artillery may be employed to reinforce infantry. The basic mission of the artillery fire is to direct its main mass along the entire area, from the front line of infantry defense to the covering force.

Usually, division artillery selects positions directly in the rear of the sector of infantry resistance, ½-1 mile from the rear boundary of this sector. Individual guns may be located also within this sector. A part of the artillery occupies well concealed positions and will open fire suddenly. Supporting or heavy field artillery added to the division, is located in the rear of division artillery positions.

Reserves in defense are designated as follows: general (division) reserve, and sector reserves. An infantry regiment, or a smaller unit, is kept in general reserve, while a unit up to an infantry battalion in strength is retained in sector reserve. Reserves are used for counterattacks and for preparing positions, in case resistance to enemy advance becomes necessary.

The depth of a defensive position of a division, including reserves, is as high as 3-3½ miles.

Division tanks, or tank units reinforcing a division, are used for sudden, brief attacks, aimed to disorganize the offense, and to support infantry counterattacks. As a rule, early in battle, tanks remain at the disposal of the division commander. Later they may be assigned to commanders of infantry units — from regimental commander upward.

Various engineering constructions, such as camouflage, sham positions, etc., are widely used.

Retreat from defensive positions is permitted only as a last resort, with the authority of senior commanders.

18 April 1939

BOMBING FROM HIGH ALTITUDES.
[Bombometanye s bolshikh vysot.] Captain P. Mayatskiy

The entire training of the navigator, and the bombing personnel, should be conducted under conditions approaching actual combat as nearly as possible.

20 April 1939

TRAINING OF RADIO OPERATOR OF A TANK UNIT.
[Podgotovka radista tankovoy chasti.] Major K. Leonov

Technical discussion of methods of training for radio liaison in tank units.

16 May 1939

RATES OF ADVANCE OF CONTEMPORARY ARMIES.
[Tempy prodvishenya sovremennykh armii.] Division Commander E. Shilovskiy

The experience of recent wars shows that no permanent standard can be established for rates of advance. Thus, in the great Austrian defeat in September 1914, the Russian Third Army, which occupied Lvov (Lemberg), capturing territory of some 124 miles in depth, advanced at the rate of 4½-6 miles in 24 hours when not resisted, and 1-2 miles when resisted. High rates of advance were accomplished by the Red Army during civil war operations against the forces of Denikin and Kolchak (1919-20), when the Soviet forces frequently advanced from 6 to 12 miles in 24 hours. Recent experiences in Spain and China, which have revealed the increased power of the defense, show the following average examples: in Spain the rate of advance was from 1 to 2 miles in 24 hours, and in individual cases 4½ to 6 miles; in China, 4½ to 7 miles for maneuvering operations, and a much lower figure for position warfare.

The author points out that the Red Army is equipped with every modern technical aid to insure high rates of advance. Since 1934 the motorization of the Red Army has increased by 260 percent, and at the present time each Red Army man is aided by 13 horsepower of motor locomotion. All this enables the quick and decisive execution in the course of action, of regrouping maneuvers, and permits the creation of mobile and powerful shock elements in the most important directions in order to carry the operations into the enemy's territory.

Past experiences and theoretical estimates indicate that the contemporary attacking force should advance 3½-5 miles in 24 hours after breaking through a strongly fortified and amply manned defensive zone. This figure will vary in either direction according to local conditions, such as actual relation of man power, the strength of the secondary defensive line, the enemy's reserve strength, etc.

Under conditions of war of maneuver on western theaters (meaning west of the boundaries of the U.S.S.R. — translator's note), the rate of advance in the offensive action of a shock army may reach about 10 miles in 24 hours.

The author concludes by pointing out the necessity for careful preliminary staff work and planning to cover every conceivable situation in this regard.

17 May 1939

HUMAN RESERVES OF THE JAPANESE ARMY.
[Lyudskiye rezervy Yaponskoy Armii.] N. Vaganov

The lingering war in China is depleting not only the Japanese finances and economic resources, but Japan's human reserves as well, which are decreasing every day. It is known that the losses sustained by the Japanese in China amount to about 800,000 men. Such great losses merit a careful inquiry into the human reserves of the Japanese Army.

According to dispatches in the Japanese press, the population of Japan (without colonies) was estimated at 72,000,000 on 1 October 1938, of which number about 36,000,000 were men. On the basis of the 1930 census, the male population in the ages of of 17 to 50, together with conscripts called to colors early in 1939, is estimated at about 15,500,000, of which 12,300,000 are men between the ages of 17 to 40. The conscription contingent, i.e., men

between the ages of 20 to 40, is estimated at 10,500,000. The number of men of most useful military age, 20 to 35, is estimated at less than 8,500,000. However, these figures do not represent the actual Japanese effective manpower, because of the rapidly growing number of Japanese conscripts who are found to be physically unacceptable for military service. Thus, while in 1925, out of every 1,000 Japanese conscripts 255 were rejected on physical disqualification, in 1936 the number of rejections for these same reasons rose to 450-500 to every 1,000 conscripts.

The author quotes Japanese sources, namely the Tokio publication "Dzi-Dzi," to show the growing desire of the Japanese to evade service in the army. According to this source, in the city of Tokio alone, in 1932, 24,184 persons evaded the draft, while in 1933 the number of draft evaders in the Japanese capital rose to 30,000.

Many cases of Japanese desertions in China are known. Also recorded are cases of suicide among Japanese soldiers, in preference to service against the Chinese.

The main source of human supply for the Japanese army is the Japanese village. But on the basis of figures of the 1930 census it is estimated, that up to now more than 1,000,000 men from the villages have been conscripted, which represents 25 to 30 percent of the entire village draft contingent.

The drain caused by the Chinese war has been equally great on skilled workers and technicians, whose lack is now felt in Japan, and efforts are made to place women at work where a man was formerly to be found.

The author concludes that the Japanese command will undoubtedly attempt a large scale draft of the population of Japanese colonies (Korea, Formosa, Manchuria, and the conquered portions of China), but that this human material is thoroughly unreliable insofar as Japanese interests are concerned.

27 May 1939

NIGHT FLIGHTS ON FAST SHIPS.
[Nochniye polety na skorostnykh mashinakh.] Navigator-Major G. Samoylov

A discussion of the problems of night flying and orientation.

30 May 1939

RECONNAISSANCE AND THE ORGANIZATION OF DEFENSE.
[Rekognostzirovka i organizatsya oborony.] Major S. Perkov

The personnel of smaller units (platoon, company, battalion) must be trained in the construction of anti-infantry and antitank obstacles, within their own defensive sectors.

FAILURE OF THE JAPANESE PUNITIVE EXPEDITION IN SHANSI.
[Proval yaponskoy karatyelncy ekspeditsii v Shandi.] E. Skalov

An interesting account of operations in Shansi in the spring of 1938, when the Japanese made an unsuccessful and costly effort to liquidate the Chinese guerrilla units which were operating against the Japanese rear in that province. This operation, which has cost the Japanese some 3,000 in death casualties, and considerable losses in matériel, failed to accomplish its purpose of surrounding and destroying Chinese guerrilla and regular units, failed because of the following reasons:

By means of clever maneuvering the Chinese were able to break the Japanese forces up into small units, attacking each one separately. The Japanese command overestimated the efficiency of its technical equipment, which proved to be of little use in a mountainous terrain.

On the other hand, the hand to hand combat tactics of the Chinese, who not only were well organized, but who fought with great determination, strongly supported by guerrilla bands and local population, proved disastrous to the Japanese.

4 June 1939

MODERN EXPLOSIVE AGENTS.
[Sovremmeniye vzrivchatiye veshchestva.] Brigade Engineer E. Antulayev

Modern warfare methods, with raids executed deep into the enemy's rear, and with aerial landing parties, introduce the question of feasibility and usefulness of transportable powerful explosives.

5 June 1939

FIRE CORRECTION FROM AN AIRPLANE.
[Korrektirovanye ognya s samolyota.] Colonel N. Figner

Technical discussion of the title subject.

12 June 1939

COMBAT TRAINING FOR TANK CREWS.
[Ognevaya podgotovka tankistov.] Captain P. Kolomeytsev

Training tank crews in independent conduct of fire is fundamental. The gunner must be trained to locate his target, to fire independently and accurately, and to make his own decisions for fire correction. During comabt it is the gunner himself, in the tank, who will be called upon to make important decisions.

MARINE CORPS GAZETTE

June 1939

THE POLICY OF THE UNITED STATES IN LATIN AMERICA

MILITARWISSENSCHAFTLICHE MITTEILUNGEN (Austria)

BY LIEUTENANT COLONEL E.M. BENITEZ, Coast Artillery Corps

January 1939

PAST AND PRESENT GERMAN MILITARY POLICY.
[Deutsche Wehrpolitik in Vergangenheit und Gegenwart.] General v.Cochenhausen

A lecture delivered in Vienna, in which the importance of close cooperation between the army and industry are stressed.

THE COMBINED DEFENSE FORCES OF NATIONS.
[Gesamtwehrkräfte der Staaten.] (I) Field Marshal Shäfer

A description of the basic organization of the army, navy and air forces of various nations and the latest developments and improvements of each.

MILITARY AND POLITICAL RETROSPECT OF 1938.
[Wehrpolitische Ubersicht.] Major General Paschek

A discussion of the main European events of the year 1938, the principal ones being the German attitude towards Great Britain and France, the annexation of Czechoslovakia and the Mediterranean situation.

THE CIVIL WAR IN SPAIN.
[Der Bürgerkrieg in Spanien.] (I) Major General v.Lerch

An account of the battle of the Ebro, 25 July 1938, with which the readers of this Review are familiar.

February 1939

ARTILLERY IN OLDEN TIMES.
[Die Artillerie in alten Zeiten.] Colonel Loncarevic-Syposs

A narrative of the development of artillery from the eleventh century to the Thirty Years' War (1618-1648). It is interesting to note that even after the discovery of gunpowder the older weapons used during the Middle Ages were not finally abandoned until the seventeenth century.

THE COMBINED DEFENSE FORCES OF NATIONS.
[Die Gesamtwehrkräfte der Staaten.] (II) Field Marshal Shäfer

Continuation of a previous article in which the author discusses administration, that is to say, finance, land, forestry, mines, manufactures, commerce and industry. Every nation should strive to produce within its own borders all the necessities of life.

THE "POCKET-BOOK" MAP.
[Die "Taschenbuchlandkarte."] Dr. Rotter

Under the present system, an unmounted map soon becomes illegible at the folds, while a mounted map leaves a small gap between sections and for this reason it is not possible to measure off distances accurately.

Dr. Rotter has devised and taken out a patent for a new method. A map of any size is cut horizontally into two or more strips of about 16 inches wide. Each strip is folded in two, with the map on the outside and then vertically, concertina-wise, into book shape.

This scheme has been adopted in principle and used in automobile road maps in this country.

THE CIVIL WAR IN SPAIN.
Der Bürgerkrieg in Spanien.] (II) Major General v.Lerch

An account of the Catalonian offensive, which culminated in the surender of Barcelona. The counteroffensive launched by General Miaja on the Estramadura front, although meeting with initial success, was of no great importance and had to be abandoned.

March 1939

GERMANY'S SEA POWER.
[Grossdeutsche Seemachtfragen.] Admiral Prentzel

Germany must be a sea power if she expects to be a world power and a naval expansion program has been adopted accordingly.

The development and progress of aviation will compel warships to operate in the high seas, far from an enemy's air bases. The primary duty of the German navy will be the protection of Germany's commerce; its secondary objective will be the destruction of the enemy's merchant vessels.

Germany visualizes her control of the Baltic and, with a friendly Great Britain, of the North Sea as well. She does not desire naval competition with Great Britain and has accepted restriction of shipbuilding on a 35 per cent basis, which she will maintain with difficulty. It is in the air that according to German opinion, Britain is particularly vulnerable.

THE AUSTRO-HUNGARIAN GENERAL STAFF.
[Uber den österreichisch-ungarischen Generalstab.] Colonel v.Zeynek

A lecture delivered in Vienna, December 1938, in which Colonel Zeynek criticizes the old Staff College for laying too much stress on technical knowl-

edge and study while neglecting development of character and initiative. According to the author, Field Marshal Conrad rendered excellent services as Chief of the Austro-Hungarian General Staff before and during the World War.

GERMANY'S METHODS TO ATTAIN ECONOMIC SELF-SUFFICIENCY.
[Deutschlands Weg zur wirtschaftlichen Selberständigkeit.] Major Prokoph

Great economy is being enforced in the use of foreign raw materials while native materials are being used to greatest possible extent.

Aluminum is largely used instead of copper which is very scarce in Germany; nickel is being replaced by synthetic metals. It is hoped that sugar produced from wood will eventually replace beet sugar and so set free large sugarbeet areas for the cultivation of other food products.

All possible steps are being taken to attain economic self-sufficiency and to adjust an adverse trade balance.

PARKING OF MOTOR VEHICLES OF MOTORIZED TROOPS WHEN NOT ACTUALLY REQUIRED IN BATTLE. (Prize essay)
[Abgestellte Kraftfahrzeuge motorisierter Truppen im Gefecht.] Major v.Manteuffel

A discussion, illustrated by photographs, showing how to handle motor vehicles during the engagement when their actual use is not required. Overhead cover must be utilized in order to screen vehicles from hostile aviation.

THE CIVIL WAR IN SPAIN.
[Der Bürgerkrieg in Spanien.] (III) Major General v.Lerch

This instalment concludes the Spanish Civil War series, and covers the fall of Barcelona and the occupation of the rest of Catalonia by the Insurgent forces.

MILITAR-WOCHENBLATT (Germany)

BY LIEUTENANT COLONEL E.M. BENITEZ, Coast Artillery Corps

19 August 1938

CYCLIST COMBAT UNITS.
[Radfahr-Kampfverbände.] General Wetzell

GENERAL VELPRY'S (FRENCH) OPINION ON THE EMPLOYMENT OF FRENCH TANKS.
[Eine französische Meinung über die französische Panzerverwendung.] (I) General v.Eimannsberger

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THE WAR IN SPAIN.
[Vom spanischen Krieg.] Colonel v.Xylander

The battle of Sagunto; General Queipo del Llano wins in Estramadura.

TROOP LEADING PROBLEM NO. 19: THE REGIMENT, COMBAT ORDERS.
[Truppenführung. Aufgabe 19: Rgt.-Verband—Entschlusz, Befehlstechnik.]

Problem No. 7: Communications of a heavy artillery battalion — motorized — during the attack.

26 August 1938

COOPERATION BETWEEN INFANTRY AND SAPPERS DURING THE ATTACK.
[Zusammenwirken von Infanterie und Pionieren im Angriff.] Major General Tiemann

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GENERAL VELPRY'S (FRENCH) OPINION ON THE EMPLOYMENT OF FRENCH TANKS.
[Eine französische Meinung über die französische Panzerverwendung.] (II) General v.Eimannsberger

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THE FOOD OF THE GERMAN SOLDIER.
[Die Verpflegung des deutschen Soldaten.] Dr. Ziegelmayer

HOW ARTILLERY TACTICS HAVE CHANGED.
[Wandlungen in der Taktik der Artillerie.] Lieut.Colonel Lancelle

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PROBLEM NO. 7: ATTACK AGAINST AN ENEMY PREPARED FOR DEFENSE.
[Truppen-Kriegsgeschichte. Beispiel 7: Angriff gegen abwehrbereiten Feind.]

TROOP LEADING PROBLEM NO. 19: THE REGIMENT, COMBAT ORDERS.
[Truppenführung. Aufgabe 19: Rgt.-Verband — Entschlusz, Befehlstechnik.]

A solution.

COMMUNICATION PROBLEM NO. 8: THE COMMUNICATIONS SECTION OF HEADQUARTERS COMPANY OF AN ARTILLERY REGIMENT.
[Aufgaben aus dem Gebiet der Truppen-Nachrichtenverbände. 8 Aufgabe.]

2 September 1938

DOES INFANTRY NEED SPECIAL SAPPER UNITS?
[Braucht die Infanterie besondere Pionierverbände?]

NEW REGULATIONS ON DELAYING ACTION.
[Neue Bestimmungen über hinhaltenden Widerstand.]

THE SOLDIER'S RATION.
[Das Mittagessen der Mannschaft.] Lieut.General Marx

THE CAPABILITIES OF TANKS MUST BE UTILIZED.
[Nutzet die Schärfe der Panzerkampfwagenwaffe!] Lieut.Colonel Braun

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ADVANTAGES OF LARGE BATTLESHIPS.
[Uberdimensionierte Schiffe.] Captain Waldeyer-Hartz, German Navy

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THE RED ARMY AFTER THE PURGE.
[Die Rote Armee nach der Säuberungsaktion.] By Agricola

THE WAR IN SPAIN.
[Vom spanischen Krieg. Die Roten gehen über den unteren Ebro.] Colonel v.Xylander

The Government forces cross the Ebro.

TROOP LEADING PROBLEM NO. 19. PART III: A SOLUTION.
[Truppenführung. Aufgabe 19 (Rgt.-Verband). Teil III: Lösung.]

9 September 1938

DECLARATION OF THE HOLY WAR BY TURKEY IN 1914.
[Der Heilige Krieg.] Major General Platz

ISSUING ORDERS DURING THE ATTACK.
[Zur Frage der Befehlsgebung im Angriff] Lieut.Colonel Hermann

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THE ITALIAN MANEUVERS.
[Die italienischen Manöver in den Abruzzen.] Lieut.Colonel Himpe

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THE EFFICIENCY OF AIR ATTACKS ON MOTORIZED COLUMNS.
[Die Wirkung von Luftangriffen auf motorisierte Marschkolonne.] (Translated from the English by Lieut. Overweg)

THE SINO-JAPANESE WAR. FRONTIER CLASHES BETWEEN JAPAN AND SOVIET RUSSIA.
[Vom Konflikt im Fernen Osten.] Colonel v.Xylander

16 September 1938

HOW SOLDIERS ARE TAUGHT TACTICS.
[Taktikunterricht an Mannschaften.] By "141"

It is better to start training on the ground by assuming a defensive situation in stabilized warfare. Tactical principles are taught by blackboard examples or sand table. The soldier is taught the effects of machine-gun fire, how to fire overhead, how to select observation posts and similar matters. At the start he should be given a clear and accurate picture of the situation.

23 September 1938

MOTORIZATION THROUGHOUT THE WORLD. COOPERATION BETWEEN ARTILLERY AND TANKS.
["Motorisierte" Gedankensplitter aus aller Welt.] Lieut.Colonel Braun

"Beyond the infantry zone, the artillery will protect the flanks of the tanks by fire, while part of the artillery will neutralize those batteries against which tanks are unable to fire." This is an extract of a recent Russian article on tank tactics.

The point is well taken, but the artillery can only protect the flanks by fire when it sees them. A definite "combat zone" must be assigned to tanks, and although this will restrict their zone of action, there appears to be no other solution to the problem.

Artillery fire should be concentrated from one important point to another, adjusting continuously by air observation. Aviators engaged in this

work should be under the artillery commander and must have received proper training in this type of work.

1 October 1938

SUPPLY OF ARMY CAVALRY BY AIR.
[Zur Versorgung von Heereskavallerie auf dem Luftwege.] By "146"

The supply of units by air is not new, but this system of supply can never displace railroads or motors. In Europe it is only an emergency measure.

According to Russian figures, the ammunition supply of an infantry division is 36 tons daily. Assuming that the strength and fire power of a cavalry division is one-third that of an infantry division, the daily consumption will then be 12 tons, which may be increased to 115 tons during combat.

The facility of these means of transportation is limited by the number of planes available and by their capacity. Bombardment planes can carry from 1200 to 1250 rations (less water); from 350 to 450 rations for cattle; from 60,000 to 65,000 rifle cartridges; 1,300 to 1,500 antiaircraft and antitank shells and from 80 to 110 artillery shells. Assuming a daily demand of from 45 to 50 tons for a cavalry division, a squadron of 25 planes will be required for supply purposes.

ATTACK AGAINST "BLOCKHOUSES."
[Gedanken zum Kampf gegen Blockhäuser.] By "33"

During the World War blockhouses made of reinforced concrete played an important role. This type of fortress has been used recently in frontier fortifications. The roof and walls can be built very strong to withstand artillery fire, grenades and bombs. However, the loopholes, entrances and ventilation openings are vulnerable spots.

Infantry arms are effective against loopholes, antitank guns being particularly suitable. Hand and rifle grenades can also be employed.

Artillery fire against loopholes can only be employed when direct fire is possible; similarly, bombs dropped by aviation are not very effective due to the small size of the target and the fact that the roofs are made bomb-proof.

14 October 1938

COMMUNICATION SYSTEMS OF THE AIR FORCES OF FRANCE AND RUSSIA.
[Das Nachrichtenwesen der Luftwaffe in Frankreich und Sowjet-Ruszland.] Colonel Nagel

Telephone and telegraph are used for communications with the zone of the interior; in the combat zone the army net is connected to that of the air fields.

Special telephone is used for communication between pilots. Conversation is almost impossible due to the noise.

Panels are used for simple messages. The use of lanterns sometimes causes confusion, therefore their use is rather limited.

21 October 1938

FUNCTIONS OF THE QUARTERMASTER GENERAL OF THE FRENCH ARMY DURING 1914-1918.
[Der Generalquartiermeisterdienst im französischen Heere 1914-1918.] By the French General Staff

During mobilization, the following sections were organized under the supervision of the Quartermaster General: field railways, motor transportation and roads, river navigation, mail, telegraphy, artillery service, engineers, sanitary corps, replacement of cattle, and maritime ports.

During the stabilized warfare period, the following new services were added: narrow-gauge railways, maintenance of roads and water supply.

The Quartermaster General's Staff consisted of 29 officers and employees.

During the September 1915 offensive there was some apprehension concerning the water supply in Champagne and it was necessary to dig wells and provide water for 600,000 men and 30,000 horses.

During the Verdun engagements the ammunition supply required 211 railway cars daily from 21 February to 1 July 1916.

In 1916 the service of supply had to provide for an army that averaged 2.8 million and 850,000 horses.

28 October 1938

INFANTRY TACTICS AGAINST ARMORED CARS CONFINED TO ROADS.
[Wie soll sich die Infanterie gegen Straszenpanzer verhalten?] Captain Brandt

The infantry should always be on guard against armored cars that can only operate on roads. The German Field Service Regulations gives the warning but does not say how these attacks can be prevented.

Captain Brandt presents several situations illustrating the various means of defense to be adopted by the infantry against armored cars while marching by roads.

THE IDEAL COMMANDER FROM THE SUBORDINATE'S POINT OF VIEW.
[Vorgesetzte. Eine kritische Betrachtung aus der Froschperspektive.] By "T"

The author describes the qualities that a superior officer should possess. He should treat his subordinates with consideration and should look after the welfare of his men, avoiding useless and unnecessary efforts. For such a leader the subordinate goes unhesitatingly to the end.

The leader should not be pusillanimous, but should act in such a way that his subordinates love him and feel proud of him.

4 November 1938

FIGHT FOR A RIVER, WITHOUT BRIDGE MATERIALS.
[Ein Fluszangriff ohne Brückengerät. Die Schlacht von Sikal, 14, bis 18. Juli 1915.] Marshal v.Urbanski

A description of the battle of Sokol, at the shores of the Bug River, 14-18 July 1915.

Due to heavy rains all fords over the Bug river had become impassible; the division bridge material was late in arriving due to railway transportation difficulties.

The Russians were defending the eastern shore of the river. The battle was very bloody with numerous hand-to-hand combats. Finally, the Russians were defeated with a loss of 51 officers and 2,507 killed in the battlefield. In addition, 8 officers and 2,800 soldiers were captured as well as large quantities of war materials.

DIFFERENCE BETWEN THE "MEETING ENGAGEMENT" AND THE "MEETING COMBAT."
[Begegnungsschlacht und Begegnungskampf.] Lieut.General Marx

The "meeting battle" is a battle in which both sides engage in combat with all the forces from march formation.

The "meeting combat" is a local engagement in which only certain troops engage from march formation.

"Meeting battles" have been rare; on the other hand, "meeting combats" have occurred frequently and have played important roles both in defensive and offensive engagements.

Many authors believe that the "meeting engagement" is a thing of the past; on the other hand, the "meeting combat" will continue to occur in the future as in the past and it will also continue to have a decisive influence upon the outcome of the battle.

11 November 1938

THE ATTACK PLANE.
[Tiefflieger.] By "156"

An abstract of an article by the Russian Colonel Ossipenko, a well known military writer, based upon the experiences of the wars in Spain and China.

This article appears on page 40 of this Review.

RECONNAISSANCE IN MOUNTAINS.
[Aufklärung und Beobachtung im Gebirge.] Lieut.Colonel Roma

This article presents a concrete example of reconnaissance in the Alps near Tyrol (formerly Austria), with sketches illustrating the various situations.

MILITARY ENGINEER

July-August 1939

ENGINEERS OF FOREIGN ARMIES. Lieutenant Thompson
THE SAFETY OF THE PANAMA CANAL. Major Colby
THE WORK OF THE BUREAU OF MINES. ITS RELATION TO INDUSTRIAL PREPAREDNESS. Finch
STRATEGIC MINERAL SUPPLIES IN FOREIGN COUNTRIES. Major Roush

NAVAL INSTITUTE PROCEEDINGS

June 1939

AMERICAN FOREIGN POLICY AND NAVAL POLICY. (Honorable Mention, 1939) Robert M. McClintock
SAMPSON AND SHAFTER AT SANTIAGO. Commander Gulliver
AIRCRAFT AGAINST U-BOATS. Robert M. Grant

July 1939

NAVAL STRATEGY. SOME MATERIAL AND MORAL ASPECTS. Lieutenant Eller
SOME LESSONS OF THE SPANISH WAR. Vincent Usera
CO-OPERATION BETWEEN THE GERMAN ARMY AND NAVY. Lieutenant Commander Krause
THE PROPOSED NICARAGUA CANAL. James L. Denig

DIE PANZERTRUPPE (Germany)

(Formerly, "Die Kraftfahrkampftruppe")

January 1939

BY CAPTAIN H.N. HARTNESS, Infantry

HORSE OR MOTOR?
[Pferd oder Motor?] (I) Dr. K. Fischer

A further discussion of the characteristics and capabilities of the horse and the motor (including bicycles) for war uses.

MOTORIZATION OF THE ARMS IN FOREIGN ARMIES. THE LATEST ABOUT EQUIPMENT, ORGANIZATION AND EMPLOYMENT.
[Die Motorisierung der Waffen in fremden heeren. Das Neueste über Ausrüstung, Gliederung und Verwendung.]

FRENCH MOTORIZED 105-MM CANNON

The 105-mm Schneider cannon is rubber-tired, has iron wheels and is motor-drawn; can travel 19 to 25 miles per hour on good roads; 10 to 13 miles per hour on poor roads. It weighs 3,375 kilograms in firing position, has a range of 18,000 yards and a rate of fire of 6 rounds per minute.

ITALIAN VIEWS ON THE MOTORIZED DIVISION IN THE DEFENSE

In "Rivista di Artiglieria e Genio" there is discussed the employment of a motorized division, whose mission is to stop a hostile breakthrough by occupying a defensive position. The motorized division consists of: 148 light, 66 heavy machine guns, 36 minenwerfers, 36 field artillery cannon, 30 tanks, 16 armored reconnaissance vehicles, 400 motorcycles, 650 light trucks, 183 medium trucks, 320 heavy trucks, all told about 1,000 motor vehicles.

There are two infantry regiments, each of two battalions; a motorcycle battalion, a tank battalion and a motorized machine-gun battalion. The artillery regiment consists of three battalions. For antiaircraft and antitank defense there is one company equipped with 20-mm machine guns.

According to its mission and orders the division had a march of 100 miles to make. The march, along good roads, was begun two hours before darkness, the division in three march groups.

First group: Advance security elements, traveling at 25 miles per hour.

Second group: The mass of the division, traveling at an average speed of 13 miles per hour.

Third group: Service elements, at 10 miles per hour.

The second group was organized into nine echelons, each echelon about 4,300 yards in length. Traffic was regulated principally by motorcyclists. The artillery was distributed in the column by batteries.

The division occupied a road space of 47 miles. The third group marched fifty minutes after the second group.

RESULTS OF FRENCH EXERCISES WITH A MOTORIZED RECONNAISSANCE BATTALION

The motorized reconnaissance battalion had the initial mission of executing reconnaissance, gaining contact with the enemy, occupying a given terrain area and thereby assisting the infantry in its entry into combat. Additional, but not related, tasks assigned were: to cover the flank of the infantry; employment of an advance guard of mixed motorized command; employment in delaying action.

As a result of these exercises it was regrettably concluded that the motorized reconnaissance battalion should be employed only at short distances in front of the main forces. Employment at great distances produced many difficulties, such as the destruction of the signal net by the enemy and the difficulty of fuel supply. The machine-gun carriers proved unsuitable; therefore motorcycles with side cars were proposed (these the Germans have). For tactical reasons mixed units of reconnaissance tanks and reconnaissance cars were employed for patrolling. It was proposed to organize these mixed units as such in the battalion. To wait until war strikes to organize the tactical unit or units is disadvantageous.

THE NEW ITALIAN BERSAGLIERI REGIMENT

According to press dispatches the new Italian Bersaglieri regiment consists of:

Staff and staff platoon, to which belong a half platoon antitank guns, observation and signal troops.

A bicycle battalion of three rifle companies and one machine-gun company. The rifle companies have nine light machine guns. The bicycles can be easily disassembled and loaded on trucks.

A battalion transported on trucks. This battalion has three rifle companies. The staff company has a mininwerfer platoon.

A mixed battalion, consisting of a motorcycle company and a company of light tanks. The motorcycle company is composed of three rifle platoons and one machine-gun platoon. The tank company has two platoons, with a total of eleven tanks.

ANTITANK DEFENSE. THE LATEST DEVELOPMENTS IN FOREIGN ARMIES AND THEIR VIEWS ABOUT EMPLOYMENT.
[Panzerabwehr. Eine Umschau über die neueste Entwicklung in fremden Heeren und die Anschauungen über den Einsatz.]

THE BRITISH ANTITANK RIFLE

The weapon weighs 16.35 kilograms, it has a caliber of 14 millimeters, fires 9 shots per minute and at 460 meters penetrates tank armor (thickness not stated). It will cause casualties among the tank crew, but will not seriously damage the vehicle. For short distances one man carries the weapon, for longer distances, such as in the attack, two men carry it. On the march, etc., it is carried on the platoon or company combat wagon.

RUSSIAN VIEWS CONCERNING ANTITANK RIFLES

In addition to the antitank gun (cannon) an antitank rifle for the infantry is necessary, such as the "Solothurn" or "Oerlikon" rifle. It must be recognized that in the future tanks will attack in mass; therefore the weapon in the hands of the infantry must be capable of combatting mass attacks. In contrast to the antitank gun, the antitank rifle has the great advantage that it can be located and concealed in shell holes and small depressions. It will not be easily recognized by the tank crews and can fire upon the rear of the tanks after they have passed. If these antitank rifles are to be beaten down and destroyed this work must be done by infantry. But infantry cannot keep pace with the tanks, which again is an advantage to the antitank rifle.

The presence of antitank rifles with the command provides an antitank defense (active) in the infantry front line, and supplements other antitank defense measures.

The author calculates 60 to 80 tanks attacking on a 1,000 meter (1,100 yard) front. With this figure as a basis he continues with a computation of probable fire effect by antitank guns disposed in depth against tanks advancing in the antitank gun zone:

No. of antitank guns per kilometer	Rate of advance of tanks		
	6 km per hr	12 km per hr	20 km per hr
	number of tanks destroyed		
6	72	36	21.5
12	144	72	43
18	216	108	65
24	288	144	86

This table is quite schematic. It presumes that all antitank guns participate in the defense during the whole time. Actually one must reckon with a minimum loss of 25%. If we continue this table we finally come to the situation where even though thousands of tanks attack the antitank gun will retain its superiority, but space alone precludes such a supposition of superiority.

There follows a discussion of the capabilities of antitank weapons. The normal caliber rifle and machine gun, under favorable conditions, are able to penetrate 11-mm of armor plate; the large caliber machine-gun bullet (12-13-mm) can penetrate at 100 meters 20-mm of armor plate when the angle of impact is 90 degrees. At 1,000 meters it can, however, penetrate only 11.5-mm of armor plate. Consequently, its effective range against light tanks is 100 to 200 meters. The antitank gun has an effective, penetrating range of 800 meters, but it is no true infantry weapon. The infantry needs two types of antitank weapons, one for long-range firing, the other for short ranges and with a high rate of fire.

At ranges greater than 400 meters the tank is helpless against antitank guns; at lesser ranges the tank becomes a most dangerous enemy of the antitank gun, and it is in these lower ranges that the antitank rifle must support the greater range gun, and from well covered positions be able to open surprise fire on the tanks.

In the construction of suitable antitank rifles two problems must be solved: (1) they must have the maximum rate of fire, and (2) they must be light in weight. With a caliber 20-mm it is possible to obtain penetrative power against 20-mm armor plate at 200 meters. The maximum weight of 30 kilograms should not be exceeded.

The antitank rifle deserves careful consideration since it contributes primarily to the defense of the infantry and above all it is and must be an infantry weapon.

February 1939

BY CAPTAIN H.D. KEHM, Field Artillery

HORSE OR MOTOR?
[Pferd oder Motor?] (II) Dr. K. Fischer

In the last of a series of articles on this controversial subject, the author continues to assemble data from scientific investigations and facts from the combat experience of foreign as well as German forces to demonstrate that, in modern war, the cavalryman is an uneconomical and inefficient fighter as compared to the cyclist, the entrucked infantryman, and the soldier of the mechanized troops.

From similar data the author draws the conclusion that the horse is not suitable as the main source of motive power for supply and evacuation purposes. Though he cites numerous other considerations, the author seems to think that the most serious limitations of the horse are: the size and nature of the target he presents to modern rapid fire weapons, his slow speed, the relatively great amount of supplies and labor required for his maintenance, and his vulnerability to chemical and air attack.

The author does suggest that the mounted trooper may be used to advantage for close-in reconnaissance behind advanced mechanized scouting vehicles. He also indicates that small units of cavalry, transported by truck and trailer, may, in some cases, find suitable employment and concludes that this matter merits further investigation.

The writer affirms that since Germany has developed from an agricultural into an industrial state with a concomitant advance in motorization, there has been and will continue to be a wider use of motors in farming. These fundamental changes have a profound influence on the problem of national defense and a suitable apportionment as between mounted troops, entrucked infantry, and mechanized forces must be determined.

ARMORED, MECHANIZED AND MOTORIZED TROOPS IN FOREIGN ARMIES.
[Panzer-, mechanisierte und motorisierte Verbände in fremden heeren.]

1938 IN RETROSPECT

Developments of the past year in foreign armies are summed up in convenient tables showing the various characteristics of tanks, armored

reconnaissance vehicles and anti-mechanization guns, and in brief descriptions of changes in the mechanization and motorization of machine-gun, artillery, chemical and engineer troops as well as in the transport of some of the foreign armies. Many of these developments were described in detail in previous issues of the periodical and some of them have been reviewed in detail in the Quarterly. This summary, however, will be found convenient for reference purposes.

It is pointed out that while improvements in 1937 were primarily in new and better weapons and vehicles, 1938 saw a continuation of this feature, but but was more noteworthy because of the experimentation in, and adoption of types of organization — especially of the larger units — and the formulation of doctrines for the employment of these modern means.

TRAINING THE ANTITANK COMPANY.
[Die Ausbildung der Panzerabwehrkompanie.] Captain Reuter

The author discusses certain parts of training regulations issued in January of 1939, indicating the doctrines upon which they were formulated. A study of the paper leads to the conclusion that he believes the following aspects of training require special emphasis.

(1) The development of a high spirit of camaraderie to insure absolute cooperation and a high morale.

(2) Speed and accuracy in the estimation of range, speed and "lead."

(3) The selection of gun positions.

(4) Ammunition supply, to insure that there will be, at the gun position, adequate ammunition for the contemplated action. It is not considered that supply during the actual fire fight is practicable.

(5) Concealment. Emphasis is to be placed upon the use of cover, the limitation of movements around the gun, judicious control of firing, and making the maximum use of the protection afforded by the gun shield.

(6) Protection against air attack. It is believed that any important tank attack will be supported by aircraft. In addition to the protection resulting from precautions taken as a result of training under (5) above, machine-gun units with antitank organizations, will have antiaircraft defense as their primary mission. Protection against hostile infantry is to be furnished by our own infantry.

(7) Disposition in depth, to increase the effectiveness of the defense.

(8) Rotation of the members of the gun crews in the various positions to the end that the gun may be properly served when crews are at reduced strength.

(9) Rapidity of fire of the individual pieces and massing the fire of the unit.

MOTORIZATION OF THE ARMS IN FOREIGN ARMIES. ORGANIZATION, EMPLOYMENT AND EQUIPMENT.
[Die Motorisierung der Waffen fremder Heere. Neues über Gliederung, Verwendung und Ausrüstung.]

Material under this heading appears in each issue. Ordinarily the bulk of the space is devoted to a discussion of the developments in a particular country. In the issue, however, it is a series of notes on developments in many countries, among them comments on our own Texas maneuvers taken from, "The Military Engineer." The article is a valuable supplement to "1938 in Retrospect" reviewed above.

The magazine also carries three articles on safety training, one on expedients for overcoming difficulties in starting motors, one on plans for the International Motor Show to be held in Berlin, February 17-March 5, and a map problem on the employment of a tank regiment.

March 1939

THE EMPLOYMENT OF AND COMBAT AGAINST MODERN TANKS.
[Verwendung und Bekämpfung neuzeitlicher Panzerkampfwagen.] Major Volckheim

(See digest, page 54.)

THEORY AND PRACTICE.
[Theorie und Praxis.]

In this article a psychologist, who has attempted to set up psychological characteristics of a good antitank soldier, is taken to task for not fully understanding the nature of such a soldier's duties and for presuming something for the science of psychology which it is not, in its present state, prepared to do. The article will please those of us who feel that the psychologists have, to put it mildly, gone "hog wild" about their vocation and its possibilities.

In the course of the discussion the writer brings up a point which an American officer discussed with this reviewer some time ago; namely, the psychological effect of names and appellations. The writer brings out, as did the aforementioned American officer, that "antitank gun" is a poor name from the point of view of describing the weapon's task and from the point of view of morale. Both suggest that these weapons would better be described as "destroyers," and the organizations which handle them as "destroyer companies." To use a well-worn expression, "they've got something there."

April 1939

BOHEMIA AND MORAVIA AGAIN BELONG TO THE EMPIRE.
[Böhmen und Mähren gehören wieder zum Reich.] Major Volckheim

The article marshals an array of historical data to demonstrate that Bohemia and Moravia, historically speaking, belong to the German nation and that they have always prospered most when they were a part of it. Be that as it may, the chief interest that the professional soldier finds in the article is the estimate of the things of military value which the author contends Germany obtained through the acquisition of the Protectorate. He lists them as follows: An annual production of 7.6 million tons of coal; ¾ million tons of iron ore (Bohemia only) and 100,000 tons of silver, lead and zinc ore. Pig iron production is estimated at 1.1 million tons and steel ingot production at 1.5 million, annually. (*)

The author goes on to point out that the acquisition of control over this highly industrialized area has taken one of the most efficient and largest munitions industrial centers (Skoda and allied firms) out of the hands of potential enemies of Germany. He states that Skoda employed 40,000 people in 1937. Available munitions plants, he says, included, 8 for the production of machine guns and small arms, 5 for guns and trench mortars, 6 for infantry and artillery ammunition, 5 for powder and explosives, 8 for motor vehicles, 7 for tractors and prime movers, 5 for aircraft and aircraft motors, 5 for military gases and 8 for gas masks. He reports that in a single year these plants had orders for 7,000 machine guns for Yugoslavia, 10,000 for Poland and 11,500 for Mexico. He adds that it is worthy of note that none of the states of southeastern Europe has its own munitions industry.

Although he gives no figures, the author states that German armament was considerably augmented, at no expense, when the matériel of the Czech Army was taken over, especially was this true in the matter of airplanes, cannon and armored vehicles.

Though the protectorate is primarily industrial, the author states that it contains 6.4 million acres of tilled land and about 3.5 million acres of forest land. He holds that the German market is materially increased, indicating that the new Germany has a population of 85.6 million, making her second only to Russia in size of population of the nations in Europe.

CAVALRY.
[Kavallerie.] Lieutenant Balck

The series of articles on "Horse or Motor?" which appeared in this magazine, evoked at least one hearty reply from a cavalryman. Lieutenant Balck points out that the appropriate answer is, "Horse and Motor." By reference to World War experiences he shows that the cavalry was effective to the extent that it adapted its arms, organization, and training to modern conditions.

He adopts the theme that the modern cavalryman must "ride to shoot and shoot to ride." In the light of this theme he makes the following suggestions.

The cavalry must make the maximum use of motors to increase its mobility, by lightening the load on the horses and by motorizing all supporting troops.

The trooper's equipment must be made lighter. To do this he indicates that the following can be dispensed with: steel helmet, the sabre, and a large part if not all of the clothing roll. The author says that the carbine should be carried over the shoulder so that the carbine boot may be discarded and holds that machine-gun loads should be carried on separate pack animals. If the suggested changes are made he maintains the saddle could be made lighter. Changes of this sort are necessary because the author feels that the cavalry must be capable of making marches of from 40 to 65 miles a day, over a period of several days.

The combat training of the cavalryman should be along the lines of the infantryman so that he may fight as the infantry does when circumstances require.

Mounted training should be modified to include more emphasis on cross-country riding and less on the riding-hall variety. Remounts should be fully trained at the remount depots — not with the troops. Training should be continued throughout the winter months to harden men and animals for field service.

Mounted sports should be modified so that instead of developing a few outstanding school riders they will develop the mass. He suggests more emphasis on shooting, endurance rides, stream crossings and obstacle rides for large groups. The author believes that hunting could be adapted for such training, but in that case, could not be restricted to officers only.

Mounted combat should be taught to the smallest units.

Protection against chemicals requires more training and research.

REPRESENTING A TANK ATTACK IN A MAP MANEUVER.
[Darstellung des Panzerangriffes im Planspiel.] Captain Christern

The author describes a device which he has found suitable for physically representing the progress of tank actions in indoor map work. It consists of a table fitted with a roller at each end of the top. This permits long maps to be unrolled over the top of the table from one end to the other. Panes of glass (or one large pane) are mounted in a frame over the map. Suitable tank dispositions are made on this glass by using small models or conventional signs. The map is then rolled at the selected speed, thus giving the effect of the tanks moving across the terrain in the formation and at the speed prescribed.

A moment's reflection indicates that the device can be very useful for teaching maneuvering of units in combat, march control, terrain estimation, and the timing of decisions and commands in a moving situation.

There seems to be no reason why a device of this sort would not be equally suitable for use in similar training in other arms. One of its greatest recommendations is that it is readily constructed. The author indicates that it can be made in three hours by the company mechanic from a table, two broom handles, a wooden frame and a suitable pane of glass.

(*) In 1936 Germany produced 158.2 million tons of coal, 15.0 million tons of pig iron and 18.5 million tons of steel.

SUB-CALIBER FIRING FOR ANTITANK GUNS.
[Kleinkaliberschieszen mit der Pak im Verband.] Lieutenant Winzer

The author describes a plan that he has found useful in training his unit in combat firing. In substance the idea is to build up a miniature section of terrain on a 1 to 10 scale. On it are represented buildings, hostile weapons and the like, as well as the normal terrain features (hills, valleys, trees, etc.). The targets may be so constructed that they can be moved to give practice in firing on moving targets.

It is interesting to note that a similar idea has been in use in many of our field artillery batteries in connection with their use of the Field Artillery Trainer introduced several years ago.

PIONIERE (Germany)

BY LIEUTENANT COLONEL E.M. BENITEZ, Coast Artillery Corps

February 1939

125 YEARS AGO. BLÜCHER'S CROSSING OF THE RHINE AT CAUB.
[Vor 125 Jahren: Blüchers Rheinübergang bei Caub.] Lieutenant Colonel Grosse

On 1st and 2d January 1814, the Silesian Army under Blücher crossed the Rhine at Caub in pursuit of Napoleon's Army. At the point of crossing, the river was about 330 yards wide with an island in the middle. The current was very swift. The Prussians utilized Russian pontons which consisted of wooden frames covered with tarred canvas and ferried troops across in the night, 31 December-1 January. The French retired after slight resistance. The bridge had a length of about 340 yards requiring 70 pontons, and was completed in 30 hours. It became too unsteady after the army had crossed over it and had to be replaced by a flying bridge.

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125 YEARS AGO. WITTENBERG.
[Vor 125 Jahren: Wittenberg.] Colonel Heye

A description of the siege and capture of Wittenberg, on the Elbe. In 1813 Napoleon left a French garrison in that place which was besieged and finally captured by the Allies in 1814.

The operations may be divided into three phases:

(1) Investment by General von Kleist, March-April 1813.

(2) Siege operations from the date of the armistice to the battle of Leipzig.

(3) Operations from the battle of Leipzig to the capture of Wittenberg 13 January 1814.

GERMAN ENGINEERS IN THE BATTLE FOR DOUAUMONT, 25 FEBRUARY 1916.
[Deutsche Pioniere beim kampf um Douaumont am 25. Februar 1916.] Major General Klingbeil

An account of some personal experiences of German engineers who participated in the assault on Fort Douaumont in 1916.

QUARTERMASTER REVIEW

July-August 1939

PIONEERS OF THE AIR. Colonel Lahm

MILITARY AUTOMOTIVE EQUIPMENT: ITS OPERATION AND MAINTENANCE. Major Brunson

THE QUARTERMASTER PROBLEM

RASSEGNA DI CULTURA MILITARE (Italy)

(Rivista di Artiglieria e Genio)

BY LIEUTENANT COLONEL E.M. BENITEZ, Coast Artillery Corps

January 1939

GIUSEPPE GARIBALDI. Arrigo Solmi

Conference given at San Remo on 22 October 1938 sketching Garibaldi's career.

THE GENOESE NAVIGATORS.
[I navigatori liguri.] Giacomo Medici del Vascello

Of the several distinguished Genoese navigators, John Cabot was the most distinguished one. Placing his services at the disposal of King Henry VII of England, he set out from Bristol on 5 March 1496 in the "Mathew" an English vessel with a crew of eighteen men. Land was sighted on 24 June 1496 and Newfoundland and Labrador were discovered for the King of England.

The "Mathew" returned to Bristol three months later and as a reward King Henry VII gave Cabot the sum of ten pounds. On December of the following year, Cabot was awarded a yearly pension of 20 pounds which Cabot enjoyed for two years before his death. Thus for the sum of 50 pounds England conquered America.

EXPLORERS AND COLONIZERS OF THE EMPIRE. (GIUSEPPE SAPETO — GIACOMO DORIA — RAFFAELLO GESTRO).
[Esploratori e colonizzatori sulle vie dell'impero. (Giuseppe Sapeto — Giacomo Doria — Raffaello Gestro).] Marshal Rodolfo Graziani

Marshal Graziani sketches and analogizes the life of Rafaello Gesto the Italian explorer who explored the course of the Juba River.

STRATEGICAL STUDIES OF THE WORLD WAR (AUSTRIAN PLAN).
[Studi di strategia sulla guerra mondiale (il piano Austriaco).] (Continued from November issue) General Pietro Ago

At the beginning of the campaign, the Austrian forces operating against Serbia consisted of the Second Army, west of Belgrade, the Fifth Army in the lower Drina and the Sixth Army in Bosnia, east of Sarajevo.

The plan of operations contemplated an attack against the Serbian Army from the north by the Fifth Army and from the south by the Sixth Army. The Second Army was to be transported to Galicia immediately after the declaration of war for the campaign against Russia.

The plan was a failure. General Potiorek attacked with two armies (Fifth and Sixth) widely separated from each other with a chain of mountains between them, on difficult terrain and lacking good means of communication. He urgently requested the use of the Second Army, which Marshal Conrad refused to grant, finally sending him only one corps.

On the Russian Front, Marshal Conrad's plan consisted in concentrating the bulk of the Austrian forces in Galicia for operations against the Russian Armies in the vicinity of Warsaw, while a smaller body covered Eastern Galicia. For the operations in Galicia, there was now available only the Second Army, weakened by the absence of one corps which Potiorek insisted he must have.

The German plans and the Austrian plans were in disagreement and Austria had to acquiesce. Lemberg was captured by the Russians while the German forces received a great setback at the Marne. The Austro-Hungarian Armies in Galicia lost about 250,000 men and immense quantities of materials.

General Ago maintains that the German strategy was wrong and that the Central Powers should have concentrated their forces against Russia. Once Russia had been defeated, the Central Powers could have concentrated their forces against France.

The lack of flexibility of the German plan and the errors made in the execution of the Austrian plan, compromised decisively the outcome of the war.

AUTARCHY AND THE ARMED FORCES.
[L'Autarchia e le forze armate.] (I) General Aldo Cabiati

In this conference given at Bologna, General Cabiati discusses the desirability of making Italy a self-supporting nation.

A recent study by the American economist, Brooks Emeny, entitled "Strategy of Raw Materials," considers — in case of war — as self sufficient, the United States and Great Britain which possess 60 per cent of the world's industries and control three-fourths of the markets; next comes Russia, then France and far behind Germany, Italy and Japan. War is, therefore, less perilous for the United States than for any other nation; for Great Britain, command of the seas is indispensable; Russia comes next; at some distance, France; lastly Germany, Italy and Japan which are highly vulnerable. (to be continued in February issue)

TACTICAL EMPLOYMENT OF FRENCH LARGE UNITS.
[L'impiego tattico delle grandi unità francesi.] (Conclusion) Colonel Umberto Garrone

The defense can be manifested in three forms:

Position defense, where there is no intention of withdrawal
Withdrawal
Delaying action.

These various types of defensive action are discussed in detail and a defensive system is illustrated by a good sketch.

The employment of the cavalry division, the light mechanized division and the motorized division are also discussed.

NEW TENDENCIES IN THE CONSTRUCTION OF FIELD RADIO SETS.
[Nuove tendenze sui particolari costruttivi del materiali radio campali.] Lieut.Colonel Giovanni Rossoni

The author explains recent improvements in field radio sets.

ROAD SURFACING.
[Viabilità militare con particolare riguardo alle soprastrutture ed al materiali leganti esclusivamente Italiani.] (Conclusion) Captain Guido D'Amico

Modern war conditions require that a road shall be constructed in the shortest possible time. The silicate of soda road, according to the author, fulfills this condition better than any other type.

The construction of roads using this type of material, is given in great detail.

February 1939

AUTARCHY AND THE ARMED FORCES.
[L'Autarchia e le forze armate.] (II) General Aldo Cabiati

According to Nanni, the annual requirements in certain raw materials per hundred thousand combatants is as follows:

Steel	400,000 tons
Petroleum	200,000 tons
Other minerals	22,500 tons
Wool, rubber and silk	3,000 tons.

Two-thirds of these raw materials are furnished by the United States, England, France and their colonies. Germany, Italy and Japan possess only eight per cent.

Mussolini has defined autarchy as the final corrective, drastic but certainly effective measure which realizes in the minimum time the maximum autonomy in the economic life of a nation.

Discussing autarchy as a national necessity, Admiral Baistrocchi sums up the characteristics and problems of present-day Italy as follows:

1. Conditions of life.
2. Central Mediterranean situation and hence restrictions on freedom of traffic.
3. Colonies not yet economically autonomous.
4. Complex configuration — peninsular and insular.
5. Great centers of life and industry, railways largely along the coast, elaborate organization of hydraulic power, readily vulnerable.
6. Land frontiers, long and difficult.
7. Sea frontiers almost as extended as those of Great Britain.
8. Total length of frontier in Europe second only to Russia.
9. Area about two-thirds that of France, with a greater population.
10. Quality of population distinctly superior, accustomed to a frugal life and experienced in four recent wars.

A definite autarchic policy has been initiated in order to make Italy, in case of conflict, independent of thought and action.

In the spring of 1937, Mussolini insisted that to gain autarchy for military requirements, Italy must, if necessary, face the total sacrifice of civil requirements for the sake of the military. Autarchy is not only an economic and political necessity for Italy, but in the present international situation it is absolutely indispensable for an adequate military preparation.

From the military point of view, autarchy falls into three parts:

(1) Subsistence and equipment for the country at large, for the armed forces and for animals.

(2) Armament (manufacture, maintenance, repair and establishment of reserves for arms proper and for ammunition).

(3) Transportation (land, water and air), including not only vehicles but supply of their fuel — solid or liquid.

In regard to subsistence stores for the armed forces, it must be remembered that while in time of peace the requirements of armed forces are scarcely three per cent of the national consumption, in war the figures rise to 60 per cent of the entire national resources. Frederic II said very accurately that "if we are to have a solid foundation for the organization of an army, we must think first of the stomach."

In the matter of troop equipment, the accomplishments of autarchy are evident. Many of the textile fibres are being perfected and adapted to the most varied requirements for the clothing and equipment of soldiers. Aluminum is taking the place of sheet iron for cups, camp kettles and mess kits. The gray-green cloth of the Italian Army contains from 30 to 40 per cent of synthetic wool and the colonial uniform cloth about 30 per cent of rayon. Knit fabrics for underwear and stockings are of mixed wool, cotton and rayon; hemp has been substituted for cotton in heavy textiles for haversacks and knapsacks, while rayon is used in proportion as high as 50 per cent.

For a decisive victory in autarchy in this field, the principal impulse must be given by the women of the nation, but in this important detail, the armed forces are setting a significant example which argues well for the future.

CLAUSEWITZ AND THE THEORY OF WAR.
[Clausewitz e la teoria della guerra.] Lieut.Colonel Emilio Canevari

The reorganization of the German Army based upon national conscription, renders very interesting the study of the fundamental idea upon which is based the conception of war in an army that has always been one of the best in the world.

The German conception of war comes as a result of the writings of Clausewitz, whose great work "On War" is little known in Italy, where Jomini's principles have always been studied exclusively.

"On War" was published for the first time in 1832, one year after Clausewitz' death. His studies were compiled from 1816 to 1818 while he lived at Coblenz where he was serving on General Gneisenau's Staff with the rank of Colonel; later on, from 1818 to 1830, while serving as Commandant of the Berlin War College with the rank of Major General. His work had two purposes:

1. To determine to what extent war could be interpreted and taught.
2. To draw conclusions therefrom, particularly in regard to the strategy employed in war.

The writer describes the arrangement of Clausewitz' well known book, "The art of war proper and the art of employment can be more properly called the conduct of war." (to be continued)

ON THE DEVELOPMENT OF THE EMPIRE.
[Sullo sfondo dell'impero.] Lieut.Colonel R. Micaletti

The author sketches the development of the Italian Colonial Empire and discusses the importance to Italy of the Mediterranean and Red Seas.

In the Central Mediterranean France has Bizerte, Great Britain has Malta, while Italy has powerful strategic bases such as Pantelleria, Tripoli, Bengasi, Tobruch, Messina, Augusta and Taranto.

THE DEFENSE OF THE FORT OF MONTE FESTA (30 OCTOBER — 7 NOVEMBER 1917).
[La difesa del forte di Monte Festa (30 ottobre — 7 novembre 1917).] Captain V. Salbitani

This fort was situated so as to command the junctions of the Fella and Butt Rivers with the Tagliamento — a great strategic position. Its armament consisted of a battery of four 149-mm battery, mountain type; one fixed battery of four 149-mm barbette howitzers and an antiaircraft section of 75-mm guns. Its garrison consisted of three officers and 200 men.

The fort went into action at 11:30 AM, 30 October. At this time the Italian XII Corps was retreating to a new defensive position. (To be continued)

THE EUROPEAN CRISIS DUE TO THE CZECHOSLOVAKIAN QUESTION.
[La crisi Europa per la questione Cecoslovacca.]

An Italian account of the European crisis at the time of the Munich Conference, when Czechoslovakia lost 28,000 square kilometers and 3,600,000 inhabitants to Germany; 1,000 square kilometers and 230,000 inhabitants to Poland and 12,000 square kilometers with almost one million inhabitants to Hungary.

VERIFICATION OF THE STABILITY OF SECTIONAL METAL BRIDGES.
[La verifica della stabilita del ponti metallici scomponibili.] Captain Carlo Betocchi

In sectional metal bridges, calculations can be restricted only to those members that are subjected to the greatest stress.

The author illustrates his ideas by presenting a specific example of a 24-meter span carrying a motor vehicle weighing 15 tons.

MOVEMENT OF MECHANICALLY PROPELLED VEHICLES IN THE DESERT.
[La marcia degli automezzi nel deserto.] Colonel Carlo Amione

Four cases of auto vehicles are discussed:

(1) A carrying wheel
(2) A carrying and driving wheel
(3) A carrying chain track
(4) A carrying and driving chain track.

The general conclusions drawn are that for carrying wheels, the wheels should be large so as to overcome obstacles and avoid sinking and the tire pressures should be low.

For carrying and driving wheels, the wheels should also be large and tire pressures low.

Carrying chain tracks are little used except in towed vehicles.

For carrying and driving chain tracks, the track should be rigid and not too pliable.

REVUE D'ARTILLERIE (France)

BY CAPTAIN ALLEN L. KEYES, Field Artillery

January 1939

THE NECESSITY FOR ASSIGNING "FLYING OBSERVATORIES" ORGANICALLY TO ARTILLERY.
[Il faut doter l'artillerie d'observatoires volants.] Lieut.Colonel A. Verdurand

In the last war the artillery lost its ability to observe and to maneuver, characteristics which it has not regained since then, and this has committed it to a policy of mass delivery of unobserved fire. The industrial and financial problems involved in the supply of these enormous quantities of ammunition have no satisfactory solution and entail a general bankruptcy in the event of another war.

The artillery must have eyes in order to use its ammunition wisely. The air arm's primary concern is its own strategic mission; the artilleryman's problem cannot be solved by reliance upon planes built to specifications which constantly demand greater speed and power nor by aviators whose contact with the artillery is incidental. Neither pilot nor observer need be a specialist in aerial warfare to use planes designed for artillery observation nor to obtain the information which the artillery needs; the essential is that the observer be a trained artilleryman.

The "flying observatory" type of plane will fly behind the friendly lines and at an altitude of 6,500 feet or less. Here it is amply protected by antiaircraft weapons with which all infantry divisions are plentifully equipped and which makes suicidal any attempt on the part of hostile aviation to linger over our lines below an altitude of 10,000 feet. Consequently the "flying observatory" can dispense with high speed, high ceiling and armament; it can be of light weight and low-powered (70 to 100 HP) and can use as a landing field any small open space, 110 yards long, in the vicinity of the battalion command post. These planes can be furnished in quantity at low cost.

Operation of such planes, equipped with dual controls, can be learned in a few hours of practical flying instruction. Their use exclusively as observatories and utilization of motor transport to convey them from one zone of operations to another preclude the necessity for a knowledge of navigation and meteorology on the part of the pilot. The extreme simplicity of the mechanism permits it to be maintained in operating condition by any reliable auto mechanic. Wing slots and wheel brakes are essential features for safe landing and taking off in small fields.

With camouflage in its present high state of development, the young aviator fresh from a training center cannot be expected to see any more on

the battlefield than any other observer who is not intimately associated with the artillery and its problems and who is not in constant touch with the tactical situation. Efficient use of aerial observation by the artillery requires that the observer be a trained artilleryman, well informed regarding the terrain, the latest elements of information of the enemy, the tactical situation and the capabilities of his guns. Even before he takes off he must know where to look, what to look for and how to interpret what he will see. He must be able to direct any necessary action on the part of the artillery. These considerations point to the artillery battalion commander or his second in command as the individuals who should execute aerial observation. It follows logically that the "flying observatory" should be assigned directly to the battalion and should depend solely on the will of the battalion commander.

The essential characteristics of this plane which have not already been mentioned are:

Pilot and observer in the nose of the ship, engine in rear, so that view of the terrain is unmasked and observation can be continuous and unfatiguing.

A maximum speed of 75 miles per hour, for use only in a high wind; a minimum speed of 30 miles per hour; a normal operating speed of 37 to 44 miles per hour.

Dual control to permit the observer to fly his own ship in the air and thus keep himself always in the most satisfactory position for observing.

Easy to handle, quick to respond and absolutely dependable so as to insure good observation, safe landing and proper conduct of fire; this last consideration demands that the observer remain close to the gun-target line for quick, accurate adjustments.

Capable of ready disassembly for transportation by truck in the battalion train, insuring arrival at the proper time and place and releasing pilots for duty with their organizations.

Pilot in close proximity to observer to allow direct communication.

Fuel capacity sufficient for four hours of flight at 55% of maximum power.

Short-range radio, voice and code.

The autogiro has received an enthusiastic welcome in certain quarters. Its ability to take off and land almost vertically and to hover over a fixed point are highly desirable characteristics. But it is not stable in a high wind and present types, with engines mounted forward, mask observation. The autogiro is still far from perfection and is very costly in comparison with suitable planes of conventional type. The latter should be adopted as standard while experiment continued with a certain number of autogiros. The artillery should not commit itself to adoption of autogiros until exhaustive experiment proves that they are capable of fulfilling all requirements. If this recommendation is followed, it can be predicted from previous experience that all artillery officers will, in a short time, and without school training, qualify as pilots of "flying observatories" and that a new conception of cooperation with infantry and tanks will result.

THE ARTILLERY IN THE BREAKTHROUGH IN THE MOUNTAINS AT THE DOBROPOLIE (SALONIKA FRONT), 14, 15, 16 SEPTEMBER 1918 — ITS PART IN THE PURSUIT TO THE DANUBE.

[L'Artillerie dans la bataille de rupture en montagne du Dobropolié (Front d'Orient), 14, 15, 16 septembre 1918. — Son role dans la poursuite jusqu'au Danube.] (Final installment) Lieut. Colonel J.B. Clamens

This article is an account of the lightning blows struck by General Franchet d'Esperey in mid-September, 1918, using the Serbian First and Second Armies with two French divisions as the spear-head of the initial attack, and of the ensuing exploitation and pursuit which in six weeks cleared all Serbia of Austrians, Bulgarians and Germans and brought about the capitulation of Bulgaria.

The attack was a surprise both as to time and place; the twenty-four hour artillery preparation left the German commander, General von Scholtz, insufficient time to move his general reserves from the Monastir and Doiran sectors to the threatened area.

Tanks were not yet available to the Allies but air superiority rested with them. They had follow-up divisions close behind the assault divisions; the initial breakthrough having been accomplished, the fresh divisions executed without delay a passage of the lines and in four days carried the attack completely through the battle position. So complete was this success on a front of 16 miles that the armies of the Central Powers were forced to withdraw on both flanks, despite mediocre results from the holding attacks delivered against them.

Pursuit was relentless; the two Serbian armies with one French infantry division, a large force of French cavalry and several attached batteries of French light, medium and pack artillery pushed ahead, outdistancing their supply facilities and finding a precarious living in the devastated area they traversed. By 29 September the forces of the Central Powers from the Monastir area, some 80,000 men, were cut off by the capture of Uskub and the Kalkandelen pass. The Serbians were on the Bulgarian border; the Anglo-Greek forces were already in Bulgaria; capitulation of Bulgaria followed immediately.

By the capitulation of Bulgaria the Allies were enabled to send three divisions to assist the Rumanians.

The Serbs drove on towards the Danube and the Save, defeating Mackensen's reinforced army in several battles, and by the end of October they were on their own northern frontier. The surrender of Hungary followed.

In the attack at the Dobropolie the French and Serbian Artillery under command of General Bunoust, Chief of Artillery of the Allied Armies, played an outstanding role. On the front of the Serbian Second Army effective counterbattery was delayed due to shortness of the preparation, lack of accurate maps and inability to obtain suitable registration prior to the dawn attacks. As the First Army did not attack until 3:00 PM, 15 August, its artillery was able to utilize the preceding daylight hours for effective airplane adjustments and transfers to witness points. The surprise effect of the Second Army's attack, however, enabled the assault troops to reach their first objective before the hostile defensive barrages could be laid down.

The infantry of both Serbian armies found it impossible to follow the rolling barrages. This was due principally to the difficult terrain to be crossed and, in the case of one battalion, to the loss of the liaison agent who was carrying the pyrotechnics for his detail. Barrages were also of insufficient density as the relatively small amount of artillery available required each battalion of direct support artillery to cover 550 yards or more of barrage front.

In general, liaison was excellent and resulted in timely and effective fire being delivered by all calibers. The usefulness of the artillery was enhanced by the excellent observation available from the allied lines and by the judgement displayed by artillery commanders who, when observation or liaison reports failed to establish the exact location of supported infantry, estimated the situation with skill and executed fires accordingly.

The following units of the French artillery took part in the pursuit with the Serbian armies:

First Army: Two 105-mm batteries and one 120-mm battery.

Second Army: One 105-mm battery, the organic artillery of the 17th Colonial Division (3 battalions of 75-mm guns and one battalion of mountain guns) and one battalion of mountain guns from the 122d Division.

The difficult terrain and arduous conditions of the pursuit had a telling effect on the men and animals, particularly the latter. The 120-mm battery early reverted to the General Artillery Reserve. The two 105-mm batteries with the First Army were able to keep pace with the leading division, taking part in all engagements and reaching the Danube with the army. This record is all the more remarkable in that out of forty-five days of combat and forced marches they had but two days of rest. The 105-mm battery with the Second Army, however, was forced by exhaustion of animals to give up the pursuit. The mountain battalion of the 122d Division stayed with the Jugoslav Division through 16 days of combat and forced marches until the Bulgarian border was reached; it lost only a tenth of its animals during these operations. The mountain battalion of the 17th Colonial Division, which had played a difficult part in the attack, started the pursuit with its animals near exhaustion and only one of its three batteries reached the Danube with the army. The horses of the light battalions of the 17th Colonial Division had suffered so much prior to the attack at the Dobropolie that only one platoon of each battery was able to start the pursuit; two of these two-gun batteries finally reached the Danube. In general it can be said that not only was pack artillery better suited to arduous campaigning in undeveloped and mountainous terrain but that mules showed far greater endurance under privation than horses.

Among the lessons drawn by the author from the experience of the artillery in this campaign are:

1. ARTILLERY POSITIONS. Every effort should be made in mountain warfare to place the heavier calibers on commanding ground where their fire is not canalized in a single valley. Artillery should be sited in so far as possible to enfilade the hostile positions; trenches dug out of solid rock are not vulnerable to frontal fire.

2. SOUND-RANGING. This is of capital importance in wooded country where concealment of batteries is easy. The detachment with the counter-battery groupment of the First Army was particularly successful in locating hostile batteries and in registering batteries of 120-mm or greater caliber. This is attributed partially to its equipment (microphones) but also to the excellent positions available, scattered along a crest parallel to the front which dominated the enemy's positions at 2 miles from his lines.

3. METEOROLOGICAL STATIONS. In mountainous terrain one should be available to every regiment or groupment, at least to every valley. The local artillery commander should be able to obtain data not only at stated hours but whenever atmospheric changes appear to justify new observations. Each station should be established in the vicinity of the batteries served and at the same altitude as the batteries.

4. ROLLING BARRAGES. However carefully it may be planned, conditions unforeseen before the attack will operate, except in relatively open country, to render the barrage ineffective as close support for infantry. In most cases it will be found preferable to fire a barrage of short duration at H-hour and to follow it with successive concentrations, planned and computed previously and fired opportunely.

5. ACCOMPANYING WEAPONS. The division commander, guided by his artillery advisor, must decide this question in every situation. The number of infantry cannon available, the supply of ammunition to them, the availability of tanks and the possibilities of their employment, the artillery's capabilities and the amount of artillery fire required during any phase of the attack, all enter into consideration of the problem. Unexpected hostile resistance will appear frequently during the attack and delay in delivery of artillery fire on this resistance is costly. If the artillery in position is unable to comply with the requirement and if timely displacement of a part of the artillery does not or cannot solve the problem, the only solution is accompanying guns, platoons or batteries.

6. DESTRUCTION OF ENEMY BATTERIES BEFORE THE ATTACK. The system effectively used by the counterbattery groupment supporting the First Army was: early adjustment of every battery by airplane on each hostile battery marked for destruction; registration immediately thereafter on a witness point; concentration of the entire groupment as a unit at the proper time on each of the hostile batteries to be destroyed. It need scarcely be said that

all German and Bulgarian batteries thus bombarded were definitely and finally put out of action.

7. NEUTRALIZATION OF ENEMY BATTERIES DURING THE ATTACK. The artillery of the First Army, having 9½ hours of daylight before the attack for adjustment and registration, successfully neutralized hostile batteries on its front by the method indicated in paragraph 6 above for fire for destruction. Present-day development of high burst ranging at night would have placed the artillery of the Second Army in a better position to accomplish similar results for an attack at daylight although this method cannot compensate for inaccurate topographical data as to location of hostile batteries.

8. FIRE ON TARGETS OF OPPORTUNITY. Flexibility in handling this problem is indicated by the different solutions presented in the attack under study. On the Second Army front the divisional artillery handled these missions. In the 17th Colonial Division the center battery of each battalion responded to calls, interrupting momentarily its barrage fire. This left a gap in the barrage which could not be filled due to the 550 yards or more of front assigned to each battalion. In the 122d Division calls for fire on previously unlocated hostile batteries were frequently transmitted to the heavy artillery groupment, subsequent fire being successfully adjusted by the liaison officer who was in position to observe.

On the First Army front these missions were assigned to the two French 105-mm batteries of the counterbattery groupment, each of which had been assigned a zone of responsibility known to the aerial observer exercising surveillance over the front. When not firing on targets of opportunity, these batteries continued counterbattery missions previously scheduled. Certain Serbian light batteries had, concurrent counterbattery missions, thus obviating complete disruption of scheduled fires. The 105-mm gun proved eminently suitable for this type of work.

9. LIAISON DETACHMENTS. Liaison detachments with the infantry in mountainous country need every means of communication with which they can be equipped. The same can be said of reconnaissance and observation parties from the heavy artillery.

10. AMMUNITION CONSUMPTION. The requirements for the attack were accurately forecast and the ammunition was available at the artillery positions. The light artillery (including mountain guns) fired 3½ days of fire, the heavier calibers 4 days of fire.

11. PERSONNEL AND ANIMALS IN THE PURSUIT. Units designated for this operation should be at full strength, or even over strength, with respect to men and animals. Both should be thoroughly conditioned before the operation, particularly in mountainous terrain where marching is exhausting and the troops may outrun the supply facilities. When necessary to compensate for loss of animals, guns should be dropped but ammunition and other supplies should be kept at a maximum. Proper measures must be taken to insure subsistence for the men who are left behind.

CONCLUSION

The Austro-German success at Caporetto, Italian Front, in October of 1917, and the breakthrough of September 1918, on the Salonika Front, amply demonstrate the feasibility of executing decisive offensives in mountainous country. Motor transportation and modern long-range weapons have made possible the concentration and supply of the great masses of artillery necessary for carefully planned operations of this character.

DETERMINATION OF PLANIMETRIC ERRORS IN TOPOGRAPHICAL OPERATIONS, BASED ON THE SOLUTION OF A TRIANGLE.
[Détermination des erreurs planimétriques commises dans les procédés topographiques, utilisant la résolution d'un triangle.] Captain P. Dusseris

Development and application to various methods of topographical location of a single chart with three series of curves by means of which the maximum errors in location of a point can be read. The chart has particular application to the method of intersection from the ends of a known base line as illustrated in high burst ranging.

MISCELLANEOUS INFORMATION.
[Renseignements divers.]

Organization:

Germany: The "Panzerdivision."
Bulgaria: Army reorganization.
Holland: Air Force.
Rumania: Artillery and tanks.

Armament:

England: 14-mm antitank rifle, Model 37.
United States: 3-inch antiaircraft gun on T-4 mount.
Czechoslovakia: Field guns and howitzers.

United States: Available strength in trained manpower.
Belgium: Motorization of artillery.

REVUE DE CAVALERIE (France)

BY MAJOR L.K. TRUSCOTT, JR., Cavalry

March-April 1939

11TH CUIRASSIERS: "THE GRENADIERS OF THE CAVALRY."
[11e Cuirassiers: "Les Grenadiers de la Cavalerie."]

An outline of the origin and development of this famous cavalry regiment. During the 18th Century, two men in each company were armed with the "carabine", a more accurate weapon than the musket in common use. These riflemen preceded the company during the advance and prepared the way for the charge by fire. In 1691, Louis XIV organized these riflemen in each regiment as an elite company of "carabiniers." In 1693, these companies of "carabiniers" were organized as a separate elite corps called the Royal Carabiniers. The author traces the regiments and brigades of "carabiniers" through the many campaigns in which they participated. In the reorganization of 1871, they became the 11th Cuirassiers, preserving that name today. They were part of the French Cavalry dismounted in 1916. During the remainder of the war, they fought dismounted, particularly distinguishing themselves at Laffaux in April 1917, at Noyon and Le Plessier-de-Roye in June 1917, and in the Argonne and Champagne in 1918.

THE 4TH LIGHT BRIGADE FROM 30 JULY TO 5 OCTOBER 1914.
[Le 4e Brigade légère du 30 juillet au 5 octobre 1914.] General Requichot

The author commanded this brigade, composed of the 2d and 4th Hussars, assigned a covering mission in northern Woevre in the sector of the II Corps. He cites the concentration orders and describes the dispositions of the brigade from 30 July to 4 August. He points out that forbidding French troops within 6 miles of the frontier permitted the Germans to detrain at the frontier, while the French had to detrain 25 miles to the west. He states that had not this restriction been made, the Germans would have been forced to detrain 21 miles to the east, and that the meeting would have taken place at the frontier; thus, terrain would not have been sacrificed and the Brey iron mines would not have been given up without combat.

The author describes briefly the operations of four officer patrols, three continuing during the period August 1-6, the other during the period August 1-12.

RURAL HORSE SOCIETIES AND THE ARMY.
[Les societes hippique rurales et l'armée.] M. De Laurens de Saint-Martin

The rural horse societies were organized in July 1934 under the Breeding Administration to assist agriculture and promote interest in horses and breeding. By stimulating interest in riding and care of animals for pleasure and sport, the societies have increased the horse population and have provided recreation and sport for rural districts. Trained horses and horsemen have great economic value, as well as potential military value. The article describes the work of the societies and their relation to national defense.

THOUGHTS ON ASSAULT OR ATTACK AVIATION. THE FUTURE OF ITS COLLABORATION WITH CAVALRY.
[Reflexions sur l'aviation "d'assaut" ou "d'attaque." L'Avenir de sa collaboration avec la cavalerie.] Lieutenant De Laitre

The author begins by pointing out that assault aviation is a new arm of shock in modern battle, intervening as a "fifth arm" in cooperation with ground troops. After summarizing experiences with assault or attack aviation, and outlining the objectives offered by ground troops, the author endeavors to show the possibilities of attack aviation and to indicate its future place in large units, particularly, large cavalry units.

THE BEGINNINGS OF ASSAULT AVIATION.—The author summarizes experience of the war in Spain, the World War, experiments in Italy, and quotes air regulations. He quotes extracts to show that employment in Spain was chiefly in close cooperation with ground troops, in which the aviation extended the range of artillery and completed the preparation by bombing and fire of machine guns. He quotes extracts to show the great moral effect of attacks at low altitude, the resulting disorder, and paralysis of movements, especially during the first phases of the war. He refers to the two occasions in which aviation acted independently of ground troops and against ground troops — Guadalajara and the less known attack against disembarking troops at Majorca in 1936.

He cites conclusions of a study of operations of British attack aviation in 1918 which indicate: necessity for unified command in the zone of operations; necessity for center of information informed by continuous reconnaissance; employment of special observation to flanks to locate general reserves; employment of extremely maneuverable planes.

Referring to a study of Italian attack aviation based on maneuvers and experience in Spain, he quotes: Infantry cannot hold in open country against a bombardment sufficiently intense; synchronization of ground and air attacks should be as perfect as possible; the only parry against attack aviation is hostile pursuit aviation. Italian regulations conclude that attack aviation is a powerful advance guard for infantry, a new accompanying arm for infantry, and emphasize total collaboration with ground troops and synchronization of ground and air attacks.

OBJECTIVES OF ASSAULT AVIATION. — In moving situations, the author thinks a large force, such as an infantry division, would present the following objectives for attack aviation: 1st, motors — trains, truck columns, tank carriers, command cars, etc.; 2d, artillery, tanks, armored vehicles; 3d, command posts; 4th, small columns of infantry and cavalry in approach formations; 5th, small groups of horses and mules of infantry and cavalry elements, machine guns, antitank guns, etc.

POSSIBILITIES OF ASSAULT AVIATION.—The author does not foresee random attacks against such objectives. He thinks that attacks must be directed against important objectives located by reconnaissance, such as bases, antitank arms, command posts, reserves, artillery, supply installations. He thinks that attacks at low altitude as done in Spain were favored by shortage of antiaircraft weapons and instructed personnel. Such actions require mastery of the air and close cooperation with artillery, and such

attacks combine with violent ground attacks by armored vehicles, represents the cavalry attack stepped up to the scale of modern battle.

ASSAULT AVIATION IN LARGE UNITS OF THE FUTURE. — He thinks that like other special arms, some unit of assault aviation will be attached to large ground units, some will be in general reserve. Those in general reserve will be destined for missions in independent actions against ground troops, like Guadalajara, or to reinforce large units engaged in particularly important operations.

ASSAULT AVIATION OF LARGE CAVALRY UNITS.—The author thinks that formations of attack aviation specialized in missions of cooperating with large cavalry or light mechanized units, will be normal in the future. Such units he thinks will be the arm of shock in the future.

SEVERAL BELLS, SEVERAL SOUNDS.
[Plusieurs cloches, plusieurs sons.]

A discussion that develops the ideas: that bombardment attack such as Guadalajara completes and supplements bombardment of artillery, with greater moral and less material effect; that motor columns cannot circulate in daylight within 18-25 miles of the front, thus rendering supply the most delicate question of a campaign; that tanks cannot be eliminated from modern combat, and that the tank menace can be met by coordinated employment of antitank defense measures; that Teruel in Spain saw a great resurgence in use of horses because horses moved—transport and artillery — where motors could not.

AN EPISODE OF THE RETREAT (26 AUGUST 1914). MORAL LIAISON OF THE ARMS.
[Un episode de la retraite (26 aout 1914). La liaison morale des armes.] H. Peyre De Betouzet

The author, of the Association of Fighting Writers, emphasizes the great moral value to other arms of audacity and self sacrifice by cavalry exemplified by events during the retreat.

THE MILITARY MOTORCYCLE.
[La motocyclette militaire.] Lieutenant Renoult

The author reviews different ideas concerning the development of the military motorcycle and side car. Some believed that development of military motorcycles should not prevent civil and police use. Some believed that the small automobile permitting sustained speed and greater comfort make the motorcycle unnecessary for civil use. Shortage of machines available on mobilization by requisition make urgent measures necessary to take care of the deficiency.

Discussing technical problems, the author refers to different types employed by various nations and tested in France, indicating the French tendency to lighter machines.

Since numbers available on mobilization will be insufficient, he thinks the solo will be restricted to liaison and communication. He details the desirable characteristics which the military motorcycle should possess.

REVUE D'INFANTERIE (France)

BY LIEUTENANT COLONEL E.M. BENITEZ, Coast Artillery Corps

November 1938

NAPOLEON.

A biographical sketch of Napoleon I, extracted from the book, "France and Her Army," by Colonel de Gaulle.

BAPTISM OF FIRE OF LIGHT TANKS. DEFENSE OF THE RETZ FOREST, May-July 1918
[Bapteme du feu des chars légers: La défense de la foret de Retz (mai-juillet 1918).] (II) Lieut.Colonel Perré & Lieutenant Suire

An account of the participation of tanks at the Retz Forest, in which the important role played by tanks can be best deducted from the words of General Niessel to the commander of the 3d Light Tank Battalion: "Thanks to their cooperation, our tired divisions were able to repel the enemy attack launched often with fresh divisions of high morale." Tanks compensated the French inferiority in numbers and morale.

THE WAR OF TANKS.
[La "Guerre des chars."] Commandant Z.

General Ludwig-Ritter von Eimannsberger has just published a new edition of his book, "Der Kampfwagenkrieg." It is interesting to compare the two editions of the book, since General Eimannsberger gave up his rank of General of the Austrian Army and without doubt now enjoys a merited reputation in Germany. It is possible that he may have modified his ideas, in view of new experiences and the evolution of both tank and antitank weapons.

According to General Eimannsberger, the experiences of the Sino-Japanese War and the Spanish Civil War are inconclusive. He devotes less than a page to these wars and dismisses them with the statement that "up to the present time employment of tanks in mass remains purely theoretical." It is known, however, that the employment of tanks in mass is the basis of the German doctrine.

In the first edition, dealing with antitank defense, General Eimannsberger only mentions the 47-mm gun; in the second edition, he remarks that the infantry cannon does not protect the forward infantry elements nor will they ever be sufficiently numerous to repel "the simultaneous attack of a flock of small tanks of the Carden Lloyd or Rousskij T-27 types — very rapid and protected against machine guns only." There are two solutions to this problem, the author states: first, by using an arm similar to the old German antitank rifle. The British have just adopted a 12.7-mm rifle weighing 15.7 kilograms, whose penetrating power at short range is equal to that of the "Tankbüsche." The latter is of 20-mm caliber, weighs 45 kilograms, and can penetrate the best 11-mm armor at 500 yards and 18-mm armor at 100 yards. This is the second solution.

In the future, the author believes that either the tank must have equipment superior to the antitank guns or else it must have thicker armor.

Presenting, as an example, an attack in a division sector comprised between the railroad and the Somme (mean front of 3.7 miles), the author states that the purpose of the maneuver consists of breaking through the position in the right zone (1.8 miles depth) where tanks can advance easily, then seize the centers of resistance that have not been attacked by taking them in reverse, and consolidate the positions captured by the tanks until the arrival of the infantry of the division.

For this operation, tanks are divided into three echelons as follows:

ECHELONS		TANKS				Depth in miles	TIME SCHEDULE
No.	Composition	Lt	Med	Hvy	Total		
1	1 Tank Regt 1 Bn armored riflemen	148	96	24	268	1.8	Cross the railroads 9:35 9:53 Forward elements to reach rear of position (3.7 mi.) 10:11
2	1 Regt less light group 2 Bns armored riflemen	67	77	24	168	1.8	Cross the railroad 10:11
3	1 Group light tanks	81	19	.....	100	.....	Cross railroad ahead of infantry 10:20 Reach rear of position: 12:20

The mission of the first echelon consists of breaking through the right of the position, to a depth of about 1.8 miles, and occupying immediately the artillery positions and the third echelon of enemy defense. The armored riflemen hold the artillery zone until the arrival of the infantry.

The second echelon follows the first echelon at a short distance to the artillery zone, occupying it, and then faces north towards the bridges over the Somme. The armored riflemen of this echelon hold the heights with one battalion, while the other battalion holds the infantry zone that has been overrun by the tanks.

The third echelon fights in close cooperation with the infantry until the entire enemy position has been captured.

General v.Eimannsberger describes the general progress of the attack as follows:

"During the night preceding the attack, 8 August 194..., the tanks which had arrived to a position under cover about 9 miles behind the front lines, form by echelons and move forward in time to reach the line of departure at the prescribed hour.

"At 9:35 the artillery opens fire; counterbattery fire is placed on every known hostile artillery battery; all antitank guns are destroyed. Hostile artillery OP's are smoked; the most dangerous antitank gun nests are taken up under destruction fire by the medium and heavy artillery batteries. Aerial observation reports effectiveness of fires and future objectives.

"At 9:35 the first tank echelon starts with the mine destructors in the first wave. The two medium groups are engaged to right and left; they have at least two companies in the first line; then, the medium tanks behind the light tanks that are protecting the armored riflemen.

"Each medium tank company has in the first wave two medium tank sections and one support section. This support section puts in action three field pieces (each group has 12 artillery pieces).

"The support sections do not follow the first wave at the same speed; they advance by echelons from observation point to observation point so as to be able to concentrate their fire against weapons that are holding up the attack.

"The fire of the sections is strictly destruction; very seldom neutralization.

"The armored riflemen seize the hostile batteries preventing them from firing upon friendly troops, and follow the tanks in order to occupy the most important key terrain positions in rear of the enemy.

"The second echelon follows the first at about 1,200 yards; liaison tanks see that it does not close up on the first echelon. Its mission, after having reached the position, is to face to the north."

[The real difficulties arising from lack of artillery support will be compensated to a certain extent by having artillery observers in tanks and in airplanes. A pursuit squadron will be assigned to the second echelon for assistance in its fight against antitank weapons.]

"The third echelon works with the infantry, which jumps off at 10:20. This infantry can at first limit its zone of advance to that part of the front where the first two echelons have made their main effort."

Such is the plan of attack visualized by General v.Eimannsberger. It will be noted that he is not satisfied with light armor, but admits the necessity of 35-mm armor. The speed of tanks is limited to about six miles per hour. To the armored riflemen is given the mission of holding key positions behind the first echelons pending the arrival of the infantry. It is passage of lines by waves; it is a mounted advance designed to overrun the enemy position.

The composition of the Panzer Regiment is as follows:

	Light	Medium	Support	
Hq. Co.	12	9		
1 light group of 4 Cos.:				
3 Secs. of 5	60			
1 Support Sec.		12		72 light tanks
1 Hq. Co.	12	9		21 medium tanks
1 Medium Group of 4 Cos.:				
1 Sec.	20			36 light tanks
2 Secs.		24		33 medium tanks
1 Support Sec.			12	12 support tanks
1 Hq. Co.	12	9		
1 similar group	32	33	12	
TOTAL	148	96	24	

Characteristics of matériel:

Light tank: machine gun and 20-mm gun inside turret; front armor, 20-mm
Medium tank: 47-mm gun inside turret; front armor, 35-mm
Light support tank: A medium tank equipped with a field piece.

THE NEW INFANTRY REGULATIONS.
[Le nouveau Règlement d'infanterie (1re partie).] Captain de Linarés

The second part of the new Regulations entitled "Combat" was discussed in the October issue of the Revue d'Infanterie. The first part of these Regulations is discussed in this article.

LESSONS FROM THE SPANISH WAR.
[Les enseignements de la guerre d'Espagne.] Lieutenant Gelot

The author analyzes some of the lessons learned from the Spanish Civil War, most of which were discussed in detail in the March 1939 issue of our Review. He quotes General Dufieux, who states that two important lessons of the World War have been confirmed:

(1) Tanks must be employed in mass on a front as extended as possible.
(2) Tanks cannot fight without artillery support nor without the assistance of the infantry that must mop up and hold the terrain.

High angle weapons are offensive arms. The infantry must have mortars in order to crush quickly any resistance that hinders the advance.

Antitank guns are efficient; infantry must have them.

This interesting article also discusses the employment of artillery, motorization and organization of large units.

December 1938

A SURPRISE ATTACK WITH TANKS. THE CAPTURE OF THE PORTE AND LOGES FARMS, 9 JULY 1918.
[Un coup de main avec chars. La prise des fermes Porte et des Loges (9 juillet 1918).] Lieut.Colonel Perré

An account of a tank operation during the Great War— 9 July 1918 — during the defensive campaign of that year. The success of this attack confirmed previous experiences, showed the capabilities and limitations of tanks and illustrated in a most striking manner the influence exerted by the employment of tanks in the conception of the maneuver. This was the first surprise tank attack launched without artillery preparation.

THE BRITISH INFANTRY.
[L'infanterie britannique.] Chauvoncourt

In 1938 the British infantry consisted of 138 battalions, of which 65 were at home.

The British believe that motorized and mechanized infantry can carry out their missions in any European theater just as well as in Palestine, Egypt or the Far East.

The infantry has at present two types of battalions to which a third has been added recently: the "motor battalion" of the mobile division.

The rifle battalion consists of a headquarters company and four rifle companies, a total of 700 men.

The machine-gun battalion consists of one antitank company of 16 guns and three machine-gun companies of from 12 to 16 guns each.

Combat trains are entirely motorized.

The "Bren" gun has replaced the "Lewis" as the light automatic weapon. Other modern weapons are the Stokes-Brandt 3-inch (76-mm) mortar, the antitank rifle (13-mm) and the antitank gun (2 pounder).

The British infantry — motorized and mechanized — presents a totally different organization to that of 1931. While the large number of vehicles confines its movements to roads and makes it vulnerable to air attacks, that same mechanization compensates these disadvantages by its rapidity and surprise of movements.

ANTITANK DEFENSE.
[La défense antichars.] Commandant Laporte

This study discusses three questions:

(1) What are the means available to the infantry for defense against tanks?
(2) What are the conditions for employment of these various means?
(3) How can we combine the employment of these means to organize the antitank defense of the various phases of offensive and defensive combat?

Tanks have some natural enemies such as terrain, limitations as to routes of advance and limited radius of action. Thus, the new Infantry Regulations state that by "a study of the terrain, the commander can determine the practicable routes of advance of tanks." A study of terrain is, therefore, the first means of antitank defense.

Natural obstacles such as woods which offer cover to antitank weapons, marshes, lakes, and water courses should be utilized to fullest extent.

The artificial means may be divided into two classes:

(1) Active: automatic arms, cannon, mines and explosives and tanks.
(2) Passive: trenches, wire entanglements, barriers.

Antitank defense doctrine is discussed in the new Infantry Regulations. Major Wanty of the Belgian Army and Dr. Helmut Klotz have drawn conclusions concerning antitank defense based upon the experiences of the Spanish Civil War.

There are some principles upon which all agree:

(1) Necessity of erecting continuous obstacles in order to prevent a sudden avalanche of tanks that would upset all offensive or defensive dispositions.
(2) Necessity of echelonning these defensive means in depth since there is no assurance that only one series of obstacles can stop a tank assault in several waves.
(3) Modifications in combat tactics as a result of the offensive potentialities of tanks.

It becomes necessary to study carefully the means available in order to combine the offensive and defensive means in the most effective manner.

In the battlefield, now as formerly, the principal enemy of the infantryman is the hostile infantry which conquers the ground, occupies, organizes and holds it. Tanks are but auxiliary means available to the infantry.

The endeavor to destroy or annihilate the enemy tanks, is simply an effort to prevent the hostile infantry from imposing its will. The infantryman must never forget that his chief mission always is to engage his real adversary, the enemy infantry.

January 1939

THE SURPRISE ATTACK OF FLIREY, 8 JANUARY 1918.
[Les coups de main de Flirey (8 janvier 1918).] Captain Ingold

The object of this surprise attack carried out by the Moroccan Division was to secure prisoners in order to gather information concerning the battle and also to cause as much destruction as possible in the personnel and enemy organization.

A detailed description of the operation, including sketch and orders, is given.

A CONCRETE CASE OF ANTITANK DEFENSE.
[Un cas concret de défense antichars.] Captains Péret and de Préval

A division problem in antitank defense, with orders and maps.

SUPPLEMENTARY NOTES ON FIELD FORTIFICATIONS.
[Notes complémentaires sur la fortification de campagne.] Colonel Rousseau

These remarks supplement a previous study on field fortifications published in the August 1938 issue of the "Revue d'Infanterie."

February 1939

DOBROPOLIE, 1918-1938.
[Dobropolje (1918-1938).] Casellas

On 15 September 1938, the first decisive battle of the war was commemorated at Dobropolie, Serbia. This victory on 15 September 1918 did

not cause much comment in France at the moment, but time has shown its importance.

THE MOTORCYCLE RECONNAISSANCE SECTION.
[Les sections d'éclaireurs motocyclistes d'infanterie.] Lieutenant Buchalet

Infantry motorcycle sections are of comparatively recent creation. In the absence of detailed regulations, the author discusses their characteristics and employment, combat of section, squad and group, and finally the contemplated action of these sections grouped into a motorcycle company.

Lieutenant Buchalet presents several situations, well illustrated with sketches. His conclusions are that the motorcycle company studied is a heavy unit, hard to command and very vulnerable. It cannot carry out night missions. However, reinforced by tanks, it has considerable defensive power and is then particularly suitable to reinforce the division reconnaissance group on the defensive; can hold a defile or village pending the arrival of the advance guards and can protect, at short ranges, a landing behind a good obstacle.

THE ROLE OF FORT MANONVILLER IN THE BATTLE OF CHARMES.
[La part du fort de Manonviller dans la bataille de Charmes.] Captain X

The siege of Manonviller took place 25-27 August 1914. In this account, illustrated by sketches, the author shows that while Manonviller was a small, isolated center of resistance, it caused the enemy considerable trouble. The fort was reduced rather quickly. The question is, what can be expected of modern fortifications, welded into a coordinated defense system, protected by mutually supporting fires and capable of resisting a siege for a considerable length of time?

ESSAY ON THE EMPLOYMENT OF TRACERS IN ANTITANK AND ANTIAIRCRAFT FIRE.
[Essai sur l'emploi des projectiles traceurs dans le tir antichar et le tir antiavion.] Captain Lamiral

A technical study of fire against fast-moving tanks and airplanes, bringing out the difficulties involved in firing against fast-moving targets.

The conclusion is that with the present means available to the infantry, fire adjustment with tracers at ranges beyond 1,600 yards (possibly 1,900) cannot be depended upon, but that up to the above limits, tracers can be readily and effectively used.

While the machine gun model 1914 cannot be used, since there is no tracer ammunition available, the machine gun models 1924-29 can use tracers to good advantage. It is an arm that can be readily put into action and is excellent for use against low-flying planes. It should be added that according to the Machine-Gun Manual, the "moral effect of tracers cannot be denied."

It seems that the ordinary rifle can also profit to a certain extent by the use of tracers.

THE 55TH RESERVE DIVISION IN THE "MIRACLE OF THE MARNE."
[La 55e division de réserve francaise dans le "miracle de la Marne."] Colonel Grasset

A reply to a conference which has been widely commented on, given in La Hague, Netherlands, by a Dutch Reserve Officer entitled, "The French 55th Division — The Miracle of the Marne."

Colonel Grasset presents a defense of the French Army in 1914 in general, and in particular, of the 55th Reserve Division, which suffered heavy losses during the German advance in September 1914. While the French command committed errors, the Germans also made mistakes, as shown by von Kluck's failure to maintain his army echelonned to the rear and his failure to reconnoiter the fortified zone of Paris from which direction an attack might be launched against the German right flank. When von Kluck was compelled to retreat in haste in order to face Maunoury's army, a gap of 22 miles at von Bulow's right was created, where the whole British army and the left of Franchet d'Esperey's Fifth Army were engaged.

March 1939

THE WAR IN GLACIERS. THE COMBATS IN THE ORTLER MASSIF (ALPS), 1915-1918.
[La guerre sur les glaciers: Les combats dans le massif de l'Ortler.] (I) Lieut.Colonel Regnault

An account of the operations in the Ortler and Adamello glaciers from 1915 to 4 November 1918, date of the Austro-Italian armistice. The extreme hardships of fighting at altitudes of over 12,000 feet, particularly in the winter when supply and evacuation presented almost insurmountable difficulties, are discussed in detail.

Maps and panoramic sketches illustrate the descriptions.

THE ANTIAIRCRAFT DEFENSE OF SENSITIVE POINTS WITH SMALL ARMS.
[La défense contre avions des points sensibles avec des armes de petit calibre.] Captain Hornus

There is not at present any official document dealing with defense of localities, villages and sensitive points (industrial establishments) by means of small caliber arms. The new Infantry Regulations foresee such defense but do not prescribe any rules to guide its execution.

The attacks that concern small arms are those below a 1600-foot altitude, at which height the gun and the 13.2-mm machine gun are inefficient.

Captain Hornus discusses the efficient radius of action of the 8-mm machine gun, and the automatic rifle at various altitudes and analyzes the method for the defense of a locality. He presents a concrete case, illustrated by a sketch showing the sectors of fire and emplacements of the various defense units.

THE FIRST STEP OF THE BRITISH TANK. THE BATTLE OF 15 SEPTEMBER 1916.
[Les premiers pas du char britannique: La bataille du 15 septembre 1916.] (I) Lieut.Colonel Gallini

The tank, contrary to what public opinion believes, is not a product of the Great War. It is as old as the world itself; but it has been transformed and adapted to the modern battle by utilizing the progress of science and military technique.

Four thousand years before the Christian era, the Oriental Sumerians used tanks. The cars had two wooden wheels and were drawn by four asses. The crew consisted of two men: the driver and the javelin thrower.

Two thousand years later, Kassites and Hittites, perfected them. They substituted horses for the asses, thus adding speed and mobility. The crew was increased to three men and a shield was provided for protection.

Darius III, King of the Persians, used a special car against Alexander's Macedonian phalanxes at the battle of Arbella.

The Carthaginians also used them, but soon they replaced them by elephants.

Elephants were too cumbersome, and gradually gave way to the cavalry, which was faster, more maneuverable, more mobile and of great shock power. The invention of firearms showed the futility of the individual shield and once again speed was resorted to in an endeavor to win the decision. The archbus and the musket gave, between rounds, enough time for a cavalry charge.

The nineteenth century saw numerous inventions, all of which will be impossible to mention. Their development, unknowingly, gradually led to the tank or combat car of the World War.

On 2 February 1916, the first tank was quietly tried out at Hatfield in the presence of distinguished officials, among them Lord Kitchener, Sir William Robertson, Balfour, Lloyd George and a number of representatives of the War Ministry and of the British G.H.Q. in France. The results were so satisfactory that 100 tanks were ordered. The tank was born.

In March 1916, Colonel Swinton was detailed to organize and assume command of the new unit that was to man these weapons. It was originally called the "Heavy Branch Machine-gun Corps"; in June 1917 it became the "Tank Corps" and on 18 October 1923, the "Royal Tank Corps." At the beginning, the unit consisted of about 700 men taken from disbanded motorized machine-gun units.

The initial organization contemplated the creation of 6 companies of 25 tanks each, with a personnel of 28 officers and 255 other ranks.

The first tanks were called the "Mark I Tank," and it was of two types: "male" and "female."

The "male" tank had the following characteristics:

Length: 32 feet 6 inches
Width: 13 feet 9 inches
Weight: 28 tons
Motor: Daimler 6 cylinders, 105 h.p.
Maximum speed: 3.7 miles
Fuel capacity: 46 gallons
Radius of action without refuelling: 23 miles
Armament: 2 guns, 37-mm; 4 machine guns, Hotchkiss
Ammunition capacity: 324 rounds of 37-mm; 6,272 machine-gun cartridges
Crew: 1 officer and 7 men.

The "female" tank, specially designed to break up the hostile counter-attacks and, therefore, required for close combat, was only equipped with machine guns: 5 Vickers and 1 Hotchkiss with 31,232 cartridges. Its weight was 27 tons.

THE ATMOSPHERE OF A BATTLEFIELD.
[L'atmosphère du champ de bataille.] (I) Lieut.Colonel Armengaud

The last war terminated twenty years ago. The number of soldiers who fought in the Great War are gradually disappearing and the next conflict may start with soldiers lacking actual battle experience. The first combats of 1914 showed that even the best units need a baptism of fire.

In peacetime, the soldier must be prepared to face conditions in the battlefield.

There are certain elements that deserve careful study:

(1) Manifestations of fire and their effect.
(2) Physical condition of the soldier.
(3) Moral condition of the soldier.

In spite of the importance of artillery fire, the infantry bullet is still the queen of the battlefield; it still remains the modern infantryman's enemy No. 1. In regard to the artillery, it should be said that it is very discomforting to be subjected to this type of fire.

Colonel Armengaud describes the effects of fire produced by the artillery, hand and rifle grenades, aviation, gas, tanks and other weapons. He analyzes the reaction to bombardment aviation and to attack aviation. The material effect of attack aviation may be small, but the moral effect is con-

siderable. Aviation is unquestionably one of the essential elements in the atmosphere of the battlefield Training must, therefore, be conducted to prevent air surprises and have assurance that an air attack will meet a fearless defense.

REVUE MILITAIRE SUISSE (Switzerland)

BY LIEUTENANT COLONEL L.W. HILLIARD, Field Artillery — Reserve

January 1939

THE BATTLE OF MARCHAIS AND "THE MIRACLE" OF THE MARNE.
[Le combat de Marchais et "le miracle" de la Marne.] (I) Colonel A. Grasset

Two articles in the January and February issues give the author's viewpoints, which are in substance as follows: Twenty-three years after the first victory of the Marne and the history of all the participants has been brought up to date, we find many differences of opinion as to whom the credit should be given. Some call the sudden reverses suffered by the German Army "a miracle." In some accounts, the Army of Great Britain is given the credit, particularly where the Germans retreated across the Marne before the attack by Marshal French.

Now it appears to the author that action by the French Fifth Army was a determining factor. The strategy of the French High Command combined with errors made by Generals von Bulow and von Kluck are explained in detail. Action taken from September 8th to 10th show that the turning point was far from a miracle. It was the outcome of a well-executed plan nearly exhausted from fourteen days of continuous fighting.

THE ADVANCE UPON THE ENEMY.
[La marche à l'ennemi.] Captain A. Delay

Under present conditions, there are three factors which tend to hinder our advance toward the enemy. These are rapid movement, enemy invulnerability, and the difficulty of effectively concealing our movements. In general, the most effective means to advance is by rapid movement, unobserved by the enemy and under the most favorable circumstances for our troops.

RAILROADS AND NATIONAL DEFENSE.
[Rail-route et Défense Nationale.] F. Tissot

This article gives the advantages and disadvantages of railroads over other means of transportation in time of war. In any event, they will not suffice for all needs, but must be supplemented by the more flexible motor transport. This study is continued in the February issue.

February 1939

THE TRANSPORTATION SERVICE.
[Le service du transit.] (I) Colonel E.M.G. Dubois

This is a study covering the whole subject of supply and transportation services. Its object is to answer some of the questions which have arisen among those interested in the following:

(1) The influence of modern war on supply and transportation services.
(2) The inconveniences of the former supply service.
(3) The transportation service.

Speed, mobility and air activity have greatly changed the service of supply. Now, instead of a supply service, it has become largely a transportation service.

This article is continued in the March issue.

THE BATTLE OF MARCHAIS AND "THE MIRACLE" OF THE MARNE.
[Le combat de Marchais et "le miracle" de la Marne.] (II) Colonel A. Grasset

March 1939

IMPORTANCE OF ORGANIC FORMATIONS.
[Importance des formations organiques.] General J. Rouquerol

[With deepest regret, we announce the death of General Rouquerol, the author of this and many other valuable military studies. News of his sickness came soon after this article was received, but he passed away before publication. The editor feels doubly sorry since his death followed so soon after that of Lieutenant Colonel Mayer. The exchange of ideas carried on between these two French officers, through the Swiss Military Review, has been of inestimable value.]

Unforeseen events in war often impose upon a superior commander the necessity of assisting a unit in difficulty or intensifying his action in a decisive moment. Often this is accomplished by attaching units which are not an organic part of the command. In many headquarters, the ignoring of difficulties growing out of units trying to carry out a mission, when the officers haven't had time to know one another, has resulted in untold confusion. The object of this study is to show, by historical examples, that often deplorable consequences are the outcome of such actions. Separation of units from their normal chain of command should be made only after thorough consideration of all the advantages and disadvantages.

In the large units, such as Army Corps, attached units are practicable for these units can operate normally with some non-organic organizations. Divisions and lower units suffer more when disrupted because of their size and normal acquaintance of their personnel one with another.

THE TRANSPORTATION SERVICE.
[Le service du transit.] (II) Colonel E.M.G. Dubois

MOTORIZED COMPANIES OF MACHINE GUNS ON TRIPODS.
[Les compagnies motorisées de fusils-mitrailleurs sur trépied.] Captain L. Sauer

ROYAL AIR FORCE QUARTERLY (Great Britain)

July 1939

GERMANY'S WAR POTENTIAL AFTER THE SEIZURE OF CZECHOSLOVAKIA. Dr. Fritz Sternberg
ROUGERON'S "AVIATION DE BOMBARDEMENT." Part III.

ROYAL ENGINEERS JOURNAL (Great Britain)

June 1939

ECONOMICS IN MODERN DEFENCE. D.J.F. Morton
IMPRESSIONS OF PRESENT-DAY RUSSIA. Major Davidson-Houston
THE CZECH SYSTEM OF FORTIFICATION. Oberst Biermann

TANK JOURNAL (Great Britain)

July 1939

THE BATTLE OF CAMBRAI. PART II: TANK PLANS FOR THE BATTLE.
TANK AND INFANTRY TACTICS AT CAMBRAI
BRITAIN'S NEW MILITARY POLICY
FOREIGN DOCTRINES ON TANK EMPLOYMENT
RUSSIAN TANK DOCTRINE
FOREIGN TANK NEWS AND VIEWS

UNITED SERVICES REVIEW (Great Britain)

4 May 1939

SPAIN AND THE NEXT WAR. Air Commodore Charlton
AIRCRAFT IN THE SPANISH WAR. Sargent

11 May 1939

THE WAR IN THE FAR EAST. Air Commodore Charlton

18 May 1939

AIR RAIDS OVER ENGLAND. Air Commodore Charlton
HOLLAND'S CHOICE. V.S. Swaminathan

25 May 1939

THE MERCHANT NAVY: PROBLEMS AND DEFENCE. Lieut.Commander Talbot Booth
PENETRATION BY PROPAGANDA. Air Commodore Charlton

1 June 1939

MILITARY PREPAREDNESS IN THE UNITED STATES. Air Commodore Charlton
FRENCH SEA POWER. THE MODERN FLEET OF OUR ALLY. Sir Herbert Russell

8 June 1939

"QUEEN OF THE BATTLE"—WHICH ARM WILL DOMINATE THE FIELD? E.G. Mandeville Roe

15 June 1939

BRITAIN'S AIR FORCE ON VIEW. Air Commodore Charlton

22 June 1939

WAR AND INTERNATIONAL FINANCE. Air Commodore Charlton

29 June 1939

RUSSIA AND THE BALTIC STATES. Air Commodore Carlton

6 July 1939

A GERMAN LOOKS AT ENGLAND. Air Commodore Charlton
ITALIAN NAVAL POLICY. THE LATEST PHASE AS A WORLD SEA POWER. Sir Herbert Russell

13 July 1939

EYES TO THE FAR EAST. Air Commodore Charlton
THE MEANS OF WARFARE. Lieut.Colonel Macnamara

20 July 1939

THE FRENCH MODERN FORTIFICATIONS
NEW GERMAN HEAVY CRUISERS. TYPES OF OTHER POWERS OUTCLASSED. Blackman
"PREPAREDNESS." THE RELATIONSHIP BETWEEN STRATEGY AND POLICY. Sir Herbert Russell

27 July 1939

IMPROVING OUR AIR DEFENCES. Air Commodore Charlton

WISSEN UND WEHR (Germany)

BY CAPTAIN H.D. KEHM, Field Artillery

January 1939

TWENTY YEARS IN THE KINGDOM OF THE SLAVS, CROATS AND SLOVENES — YUGOSLAVIA.
[Zwanzig Jahre Königreich SHS — Jugoslawien.] Major General Kundt

This article is an excellent summary of the development of Yugoslavia since its formation after the World War. The essay is important to the soldier because it gives a clear insight into the needs for an integration of the economic, social, and political forces with an effective national defense force to insure the existence and growth of a nation under modern European conditions.

The writer brings out clearly the internal problems; disputing minorities (the Croats forming the most effective group of dissidents) and an undeveloped economic system and the external political dangers; intrigue against the government from bases in other lands (particularly Hungary, Italy and Austria) and the machinations of the Great Powers in the Balkan area which threatened to enmesh the new state in dangerous alliances.

The picture of the foresight and skill of Alexander in comprehending these problems and in his methods of solving them is a real tribute to the king — or perhaps to the men who were his chief advisors. The author brings out that every device was used to minimize the minorities problem. The Sokols (youth organizations dating from pre-war times) were organized on a national basis and nationalist propaganda substituted for separatist teachings. New political districts were organized to minimize the ethnic distinctions. The name of the state was changed and a truly national was adopted. The army was strengthened and reorganized to further national solidarity. A skeptic might read between the lines that this meant ruthless suppression of what we ordinarily call "rights." The article, however, gives one the impression that such has not been the case. These "rights" have not been preserved to the extent that we enjoy them in the United States, but there is plenty of evidence adduced to show that the limitations were necessary under existing conditions and that they have been relaxed where circumstances permitted.

In discussing the foreign relations of the country the author shows how Yugoslavia was at first required to submit to external pressure because of her inability to defend herself. He shows that when her forces were strong enough to make her wishes effective, she assumed leadership of the Little Entente, was enabled to defeat unfriendly gestures and to shape her policy to make sure that she had friendly neighbors. The gradual swing from an orientation toward France to one toward the Rome-Berlin axis is skillfully traced.

Particularly interesting is the author's demonstration of how Yugoslavia twice prevented a Hapsburg restoration and his explanation of how any danger of a serious threat from Italy has been mitigated.

The essay is of value to those who are interested in noting the influence of military power upon the growth of a nation as well as those who want to have a hasty summary of the background of Yugoslav affairs against which to study current affairs in this key area.

The author does not mince words in his description of the part Italy and Hungary played in the difficulties which confronted the new state. This will be a distinct surprise to those who stoutly maintain that everything published in Germany must treat Germany and the states friendly to her as angels without dirty faces.

THE POLITICAL AND NAVAL SIGNIFICANCE OF THE SOVIET BASE ON THE MURMANSK COAST.
[Die seestrategische und politische Bedeutung des Stützpunktes der Sowjetunion an der Murmanküste.] Captain Ebert, German Navy, Retired

This essay which won the prize in its class in a 1937-1938 competition, depicts the strategic, economic and political aspects of the development of the Siberian area along the Arctic coast which Russia has been pursuing during recent years. It confirms some of the reports on this venture which have appeared in American periodicals, notably those dealing with the types and extent of the resources of the area.

In the strategical aspect the writer stresses the fact that Leningrad is now a vital hub of the Baltic, White, and Arctic coastal areas. To protect this hub and the Murmansk area (the end of one of the spokes) the Soviets have planned strategic roads, railroads, and aviation facilities and have moved in strong military forces.

Politically, he says, the Russians have pursued an aggressive policy against the Scandinavian countries to gain strategic and economic advantages. The seizure of Franz-Joseph land, the creation of the strong naval base at Murmansk, and Russian efforts to oust the Norwegians from Spitzbergen illustrate this policy.

The author believes that Russia intends to make herself a great power on the sea. He cites the Murmansk developments and increases in her naval equipment to prove the point. He feels that Russia's aim is to put herself in a position to threaten commerce in Atlantic as well as in Far Eastern waters, either by raiders or by mass employment of sea power.

A fleet blockading Russia from the Atlantic would require a base or bases on the north Scandinavian coast. Russia's strategy must be to prevent the occupation of such a base. Hence she is a real mencae in this area — one which the Swedes and Finns have recognized and are preparing to oppose by strengthening their defenses.

The writer points out that history and tradition demonstrate that Russians are not skilled seamen. Their naval leadership, never very good, was largely destroyed in the Revolution. This is one great obstacle that the Soviets must overcome before they can be truly effective on the seas.

TO WHAT EXTENT IS TRANSPORTATION ABLE TO INFLUENCE THE INCEPTION AND PROGRESS OF MILITARY OPERATIONS?
[In welchem Masze vermögen Verkehrsmittel den Ansatz und Verlauf militärischer Operationen zu beeinflussen?] Colonel von Mantey, Retired

The essay (awarded third prize in its class in 1937-38) considers railroads, horse and motor drawn vehicles, aircraft, sea craft, and inland waterways equipment.

The author points out the necessity for adequate transport for troop and supply movements to the theater of operations, citing the success of the initial German advances in 1914 and the transfers of troops from one front to the other throughout the war.

On the premise that surprise and mobility are prerequisites to success in any military operation, the author develops the idea that these can be secured and maintained only so long as fresh forces can be brought up to meet those that the enemy may employ and, in addition, keep all troops constantly supplied with munitions and other necessities. In short, mobility during an operation is determined by adequacy of supply.

The author cites a statement of von Schlieffen to the effect that military operations must slow down, if not cease, when the troops are more than 75 miles from a railroad. He shows that von Falkenhayn and von Ludendorff both believed this dictum and were governed by it.

The author cites the 1915 offensive on the Eastern Front as the most valuable illustration of the influence of transport on an operation. After showing how the railroad system determined the direction of the attacks in May and June, he shows that Hindenberg appreciated the importance of transport in that he proposed an attack in the direction Kovno-Vilna where the German net was adequate and where he could disrupt Russian lines. Falkenhayn proposed a drive on Brest-Litovsk. The official records indicate that he appreciated the importance of communications, even if his picture was not as accurate as Ludendorff's, because he constantly refers to the need for building up the railroads beyond the German frontier and proposed that strong mounted raids be made on Russian lines in the vicinity of Vilna.

As the attacks progressed (under the Falkenhayn plan) the armies soon suffered inadequacies of supply because of a lack of transport facilities until it bogged down. Later the main effort was directed on Vilna by the force of transport circumstances. Colonel v.Mantey assembles convincing data to show that the offensive might have been decisive for the war had it peen pushed against Vilna earlier and with special attention to railroad repair and reconstruction. This and other examples indicate that, on the German side, the railroads were the key means of transport in the World War. However, he cites cases in which the use of river craft, motor vehicles, aircraft, and submarines were of vital importance.

The author concludes that a commander in the future must do sufficient prior planning to insure the presence of adequate men and supplies both at the beginning and in the progress of an operation. Often he must balance tactical opportunities against logistical difficulties. To make a proper decision in such a case will require a thorough understanding of these problems and an indomitable will. This requirement will be unceasingly more urgent when strong air forces are able to operate against available transport means.

THE JAPANESE CAMPAIGN IN CHINA.
[Japans Feldzug in China. Vom Fall Nankings bis zum Hoang-ho-Ausbruch.]

REVIEW OF DEFENSE POLICIES IN EASTERN EUROPE.
[Wehrpolitische Ubersicht über den osteuropäischen Raum.]

February 1939

125 YEARS AGO. POLITICAL AND MILITARY CONTROL IN THE CAMPAIGN OF 1814.
[Vor 125 Jahren. Politische und militärische Führung im Feldzug 1814.] General v.Cochenhausen

The writer picks up the situation at the Frankfort conference held after the battle of Leipzig. He points out that the politicians were in the main content with their gains and were ready to make peace with Napoleon. Metternich went so far as to offer a settlement to the Emperor. He reports that the military commanders all realized that peace could be made only with a defeated Napoleon but that they were at wide variance as to plans for bringing about that defeat. He holds that Gneisenau was correct when he pictured France in need of time to create new field forces and so urged a rapid drive on Paris on a broad front. Should the French then weaken their fortresses — to oppose the advance in the northwest — he proposed

to defeat them in open battle with the vastly larger allied forces. If, on the other hand, the French strengthened the fortress garrisons at the expense of the field forces, the allies could make a quick move on Paris around the fortified area — a sort of a preview of the Schlieffen Plan. This plan was opposed by the allied GHQ who proposed an envelopment through Switzerland.

We now know that the diplomats eventually saw Napoleon's game of delay and that a compromise military plan was eventually followed, with the customary results — lack of cooperation, division of forces, and vaccilation.

The author attributes the plan of having Blücher move on Paris along the valley of the Marne, while the main forces moved on the same objective via Troyes, to Schwarzenberg. He holds that Blücher's victory at La Rothière had raised the prestige of the Prussian at the expense of that of the Austrian, so the latter planned to put himself in the spotlight.

Historians have given various theories as to why the allies split their forces after defeating Napoleon at La Rothière. Mitchell indicates that it was done to enable the forces to be fed. Others attribute it to Blücher's impatience with the Austrian High Command. The author states that Schwarzenberg resented the increased prestige which Blücher gained at La Rothière and therefore relegated him to a secondary position, i.e., commander of a flank force. Metternich too, feared the Prussian power and hence reinstituted negotiations with Napoleon to dampen the ardor of the other allies for more fighting. Under such circumstances the succession of defeats which the allied armies suffered between then and March — when they signed the Treaty at Chaumont in which they agreed not to enter into separate peace negotiations — is quite comprehensible.

Thereafter, though the two armies remained separated for a longer time and by greater distances than seem reasonable, there was greater cooperation in the matter of making troops available to the Silesian (Blücher) or the main (Schwarzenberg) armies as they were needed.

After the battle of Laon, where Blücher made a successful stand against a determined attack by Napoleon and inflicted heavy losses upon him, the author points out that an unusual lethargy and caution seemed to permeate the thinking and action of the Blücher-Gneisenau team. History, he says, has derided Gneisenau for his vaccilation and delay and has assigned various reasons therefor. The author, however, believes that none of them are sound and offers the following: First, Gneisenau saw clearly that the Prussian forces had carried the brunt of the fighting since Leipzig and had suffered serious losses. At the same time the total strength of the allies was now so vastly greater than that of Napoleon that an allied victory was inevitable. There could, therefore, be no possible need to risk further serious losses of Prussian forces and thus weaken the power of Prussia to secure her just dues at the peace negotiations. Gneisenau, according to the writer, realized, as Bismark did later on, that "a lieutenant and ten men" make a diplomat effective. He was not going to take a needless chance to weaken his own state.

Second, he says that the difficulties in the command situation forced Gneisenau's hand. Blücher became ill early in March and was practically incapable of command. The next senior officer, Langeron, did not have the confidence of the corps commanders, especially not that of the Prussians. Gneisenau, therefore maintained the fiction of command by Blücher.

These deductions are the most striking part of the article. Whether they are correct or not is perhaps immaterial. The point is that they demonstrate that political interference in military campaigns must always be expected where allied armies are involved. The high command should be prepared to make the best of them. In the second place, they demonstrate that a commander must keep the future political welfare of his state in mind in planning military operations. The allied welfare, in the big picture, required the overthrow of Napoleon. Gneisenau saw that fact and was ready to sacrifice his forces to gain that end, so he urged the immediate advance on Paris. After that overthrow was assured he advocated that it be accomplished by the most economical (in men and material) manner. He felt that in this way the allied objective would be gained and at the same time the power of his state would be preserved. One cannot help but note the parallel between the position of Gneisenau in 1814 and that of Pershing in 1918. Both were accused of jeopardizing the allied cause. Neither of them actually did so. Both had to conserve and build up their own national power. Both scceeded in accomplishing that end.

The author quotes Clausewitz' apt thought on this scope: "It is not true that the influence of politics on the conduct of war is in itself evil. Evils in the conduct of the war result only when the politics is bad."

EVOLUTION OF THE ART OF WAR BETWEEN THE EIGHTEENTH AND NINETEENTH CENTURIES.
[Zum Problem des Wandels der Kriegskunst vom 18. zum 19. Jahrhundert.] Eberhard Kessel

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THE JAPANESE CAMPAIGN IN CHINA. FROM THE CLOSING OF THE LUNGHAI CORRIDOR TO THE FALL OF HANKOW.
[Der Feldzug Japans in China. Von der Schlieszung des Lunghai-Korridors bis zum Fall Hankous.]

The author describes the joint action between the army and navy in the advance up the Yangtze. He brings out the interesting fact that destroyers were employed for reconnaissance purposes to determine the nature of the Chinese positions on land. Anking he describes as being a typical "landing on a hostile shore" operation. Thereafter the army advance on shore, under cover of naval gunfire. The land forces found the Chinese resistance to their advance very effective, motorized and mechanized units were rendered virtually useless by the skillful use which the Chinese made of terrain which by its very nature was unfavorable for the employment of such forces. The navy, on the other hand, proceeded rapidly up the river and was finally halted by a barrier in the river consisting of junks and other small boats loaded with stones and cement, lashed together with timbers, and sunk in the river. The writer points out that aircraft bombing attacks failed to make a breach in the barrier after several days of effort. Land fortifications and machine guns beat off the attempts of the battleships to make a break in the obstacle. The barrier was finally taken by a combined naval, air, and land attack. After its capture, the advance to Hankow was rapid.

The most interesting part of this article is the discussion of the Tschangkufeng incident between the Japanese and Russian troops which took place in July of 1938. The German account tells that the Russian mechanized material was demonstrated to be faulty and unserviceable, the ammunition defective, and the leadership thoroughly inadequate. It stresses, as others have, the fact that the "purge" has had an indelible weakening effect on the officers. It cites reports of prisoners to show that supply arrangements proved incapable of properly supporting the action.

LAGARDE, THE FIRST MAJOR ENGAGEMENT IN THE WORLD WAR, 11 AUGUST 1914.
[Lagarde, das erste gröszere Gefecht im Weltkriege am 11. August 1914.] Colonel v.Nippold

The author states that his purpose is to indicate to those without war experience just what the first big fight is like to men and officers. He places special emphasis on the human reaction. On the premise that the deciding element, no matter what the nature of the weapons may be, is the man who is doing the fighting, he pays special attention to the effects of human reactions. The presentation is interesting from this and other aspects, notably for its description of the actions and reactions of small groups and individuals, introduced from time to time to illustrate particular points. Thus to illustrate the effect of training and discipline he describes the situation in which a brigade commander issues his field order as, "just as we had been accustomed to have them in maneuvers." There are also incidents to demonstrate the inadequacy of pre-war training, such as descriptions of massing of troops on roads, neglecting utilization of the cover afforded by terrain, and employing cavalry in mounted attacks against infantry in position.

The account provides valuable material for troop-leading studies. It is to be continued in the March issue.

SURVEY OF DEFENSE POLICIES IN WESTERN EUROPE.
[Wehrpolitische Ubersicht über den westeuropäischen Raum.]

A survey of the leading policies affecting national defense of the nations in this area.

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LIST OF PERIODICALS INDEXED AND KEY TO ABBREVIATIONS

A Ord = Army Ordnance
A Quar = Army Quarterly (Great Britain)
Bul Belge Mil = Bulletin Belge des Sciences Militaires (Belgium)
Can Def Quar = Canadian Defence Quarterly (Canada)
Cav Jour = Cavalry Journal
Cav Jour [GB] = Cavalry Journal (Great Britain)
Chem War Bul = Chemical Warfare Bulletin
CA Jour = Coast Artillery Journal
FA Jour = Field Artillery Journal
Ftg Forc = Fighting Forces (Great Britain)
La France Mil = La France Militaire (France)
Inf Jour = Infantry Journal
Jour RAMC = Journal of the Royal Army Medical Corps (Great Britain)
Jour R Art = Journal of the Royal Artillery (Great Britain)
Jour RUSI = Journal of the Royal United Service Institution (Great Britain)
Jour USII = Journal of the United Service Institution of India (Great Britain — India)
Kras = Krasnaya Zvyezda (Russia)
MC Gaz = Marine Corps Gazette
Mil Mitt = Militärwissenschaftliche Mitteilungen (Austria)
Mil-Woch = Militär-Wochenblatt (Germany)
Mil Eng = Military Engineer
Nav Inst Proc = Naval Institute Proceedings
Panzer = Panzertruppe (Germany)
Pion = Pionere (Germany)
QM Rev = Quartermaster Review
Ras Cul Mil = Rassegna di Cultura Militare (Italy)
Rv d'Art = Revue d'Artillerie (France)
Rv de Cav = Revue de Cavalerie (France)
Rv d'Inf = Revue d'Infanterie (France)
Rv Mil Suisse = Revue Militaire Suisse (Switzerland)
RAF Quar = Royal Air Force Quarterly (Great Britain)
Roy Eng Jour = Royal Engineers Journal (Great Britain)
Tank Jour = Tank Journal (Great Britain)
US Rev = United Services Review (Great Britain)
Ws & Wr = Wissen und Wehr (Germany)

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The army's new weapons and equipment. (Jour RUSI — May 1939)
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Motorization throughout the world. Cooperation between artillery and tanks. (Mil-Woch — 23 Sep 1938)
The attack. (Can Def Quar — Jul 1939)
The employment of and combat against modern tanks. [See "Foreign Military Digests"]
Reconnaissance and the organization of defense. (Kras — 30 May 1939)
Combat training for tank crews. (Kras — 12 Jun 1939)
Armored, mechanized and motorized troops in foreign armies. (Panzer — Feb 1939)
Training the antitank company. (Panzer — Feb 1939)
Representing a tank attack in a map maneuver. (Panzer — Apr 1939)
Miscellaneous information. (Rv d'Art — Jan 1939)
Several bells, several sounds. (Rv de Cav — Mar-Apr 1939)
Baptism of fire of light tanks. Defense of the Retz Forest, May-July 1918. (Rv d'Inf — Nov 1938)
The war of tanks. (Rv d'Inf — Nov 1938)
Lessons from the Spanish War. (Rv d'Inf — Nov 1938)
A surprise attack with tanks. The capture of the Porte and Loges Farms, 9 July 1918. (Rv d'Inf — Dec 1938)
Antitank defense. (Rv d'Inf — Dec 1938)
A concrete case of antitank defense. (Rv d'Inf — Jan 1939)
The first step of the British tank. The battle of 15 September 1916. (Rv d'Inf — Mar 1939)
The infantry needs a battleship. (Cav Jour [GB] — Jul 1939)

TERMINOLOGY (MILITARY)

Modern military terminology. (Inf Jour — Jul-Aug 1939)

TOPOGRAPHY SURVEYING

Maps Mapping

The "pocket-book" map. (Mil Mitt — Feb 1939)

TRANSPORTATION

New developments in the organization and equipment of cavalry. (Cav Jour — May-Jun 1939)
Supply of army cavalry by air. (Mil-Woch — 1 Oct 1938)
Tomorrow's troop carrier? (Inf Jour — Jul-Aug 1939)
Field organization of the services of supply in the German army. [See "Foreign Military Digests"]
The artillery in the breakthrough in the mountains at the Dobropolie (Salonika Front), 14, 15, 16 September 1918; its part in the pursuit to the Danube. (Rv d'Art — Jan 1939)
Railroads and national defense. (Rv Mil Suisse — Jan 1939)
The transportation service. (Rv Mil Suisse — Feb, Mar 1939)
To what extent is transportation able to influence the inception and progress of military operations? (Ws & Wr — Jan 1939)

TUNISIA

The problem of Tunisia. (Can Def Quar — Jul 1939)

TURKEY (ARMY OF)

Declaration of the Holy War by Turkey in 1914. (Mil-Woch — 9 Sep 1938)

U

UNITED STATES (ARMY OF)

Command and Staff

Military preparedness in the United States. (US Rev — 1 Jun 1939)

Organization and Equipment

Miscellaneous information. (Rv d'Art — Jan 1939)

UNITED STATES (NAVY OF)

Command and Staff

American foreign policy and naval policy. (Nav Inst Proc — Jun 1939)

W

WAR PEACE

Economics in modern defence. (Roy Eng Jour — Jun 1939)
Holland's choice. (US Rev — 18 May 1939)
"A nation's fighting power is not now merely gauged by its armed fighting strength, but also by its productive strength." (Jour USII — Apr 1939)
"Our national characteristics are more favourable to a process of evolution than to revolutionary changes. Evolution towards closer coordination between the three Services in peace and closer cooperation in war has made appreciable progress since 1918. Trace the progress of these developments up to date and discuss what should be the goal at which evolution should aim and by what steps this goal should be approached." (A Quar — Jul 1939)
The policy of the United States in Latin America. (MC Gaz — Jun 1939)
Field Marshal economics. (Inf Jour — Jul-Aug 1939)
Some problems of today. (Can Def Quar — Jul 1939)
War and international finance. (US Rev — 22 Jun 1939)
Eyes to the Far East. (US Rev — 13 Jul 1939)
The combined defense forces of nations. (Mil Mitt — Jan, Feb 1939)

WARS

ANCIENT

Cannae: The perfect battle. (Cav Jour — May-Jun 1939)

ASIA

JAPAN-CHINA (1930-)

The medical organization of the Shanghai Emergency, 1937. (Jour RAMC — May 1939)
Shanghai Emergency, 1937. (Jour RAMC — May 1939)
Burma and the Sino-Japanese conflict. (Ftg Forc — Jun 1939)
The war in the Far East. (US Rev — 11 May 1939)
The Japanese campaign in China. (Jour RUSI — May 1939)
Eighteen months of war in China (1937-1938). (Bul Belge Mil — Jan, Feb, Mar 1939)
The Sino-Japanese War. (Mil-Woch — 9 Sep 1938)
A new phase in China. (Inf Jour — Jul-Aug 1939)
The Sino-Japanese conflict. (Can Def Quar — Jul 1939)
Eyes to the Far East. (US Rev — 13 Jul 1939)
Japanese cavalry in the war with China. [See "Foreign Military Digests"]
Failure of the Japanese punitive expedition in Shansi. (Kras — 30 May 1939)
The Japanese campaign in China. (Ws & Wr — Jan, Feb 1939)

EUROPE

NAPOLEONIC WARS (1795-1815)

The campaign of persistence: Bonaparte in Italy. (Inf Jour — May-Jun 1939)
125 years ago. Blücher's crossing of the Rhine at Caub. (Pion — Feb 1939)
125 years ago. Wittenberg. (Pion — Feb 1939)
125 years ago. Political and military control in the campaign of 1814. (Ws & Wr — Feb 1939)

SPANISH CIVIL WAR (1936-1939)

Aircraft in the Spanish War. (US Rev — 4 May 1939)
Some lessons of the Spanish War. (Nav Inst Proc — Jul 1939)
The War in Spain. (Mil-Woch — 19 Aug, 2 Sep 1938)
The attack plane. [See "Foreign Military Digests"]
The Civil War in Spain. (Mil Mitt — Jan, Feb, Mar 1939)
Lessons from the Spanish War. (Rv d'Inf — Nov 1938)

UNITED STATES

REVOLUTION (1775-1783)

Mutiny or a bounty? (Inf Jour — Jul-Aug 1939)

SPANISH-AMERICAN WAR (1898)

Sampson and Shafter at Santiago. (Nav Inst Proc — Jun 1939)

WORLD WAR (1914-1918)

E — General Military History

The Austro-Hungarian General Staff. (Mil Mitt — Mar 1939)

G — Arms and Services

AIR ARM

Antiaircraft defense. [See "Original Military Study']'

ARTILLERY

The War of 1914-1918 on the Russian Front. (Bul Belge Mil — Jan 1939)
The artillery in the breakthrough in the mountains at the Dobropolie (Salonika Front), 14, 15, 16 September 1918; its part in the pursuit to the Danube. (Rv d'Art — Jan 1939)

CAVALRY

Neglected mobility. The Corps Conneau at the Marne, September, 1914. (Cav Jour — Mar-Apr 1939)
11th Cuirassiers: " The grenadiers of the cavalry." (Rv de Cav — Mar-Apr 1939)
The 4th Light Brigade from 30 July to 5 October 1914. (Rv de Cav — Mar-Apr 1939)
An episode of the retreat (26 August 1914). Moral liaison of the arms. (Rv de Cav — Mar-Apr 1939)

CHEMICAL

Fighting a chemical platoon. (Chem War Bul — Jul 1939)

ENGINEERS

Fight for a river, without bridge materials. (Mil-Woch — 4 Nov 1938)
German engineers in the battle for Douaumont, 25 February 1916. (Pion — Feb 1939)
The role of Fort Manonviller in the Battle of Charmes. (Rv d'Inf — Feb 1939)

INFANTRY

The 55th Reserve Division in the "Miracle of the Marne." (Rv d'Inf — Feb 1939)

QUARTERMASTER

Functions of the Quartermaster General of the French Army during 1914-1918. (Mil-Woch — 21 Oct 1938)

TANKS

The Battle of Cambrai. Part II: Tank plans for the battle. (Tank Jour — Jul 1939)
Tanks and infantry tactics at Cambrai. (Tank Jour — Jul 1939)
Baptism of fire of light tanks. Defense of the Retz Forest, May-July 1918. (Rv d'Inf — Nov 1938)
A surprise attack with tanks. The capture of the Porte and Loges Farms, 9 July 1918. (Rv d'Inf — Dec 1938)
The first step of the British tank. The battle of 15 September 1916. (Rv d'Inf — Mar 1939)

H — Military Conduct of the War in the Field

Offensive thoughts. (Ftg Forc — Jun 1939)
My second mission in Russia during the World War. (Bul Belge Mil — Feb 1939)
Functions of the Quartermaster General of the French Army during 1914-1918. (Mil-Woch — 21 Oct 1938)
Fight for a river, without bridge materials. (Mil-Woch — 4 Nov 1938)
The Wotan position. (A Quar — Jul 1939)
T. E. Lawrence. (Can Def Quar — Jul 1939)
Strategical studies of the World War (Austrian Plan). (Ras Cul Mil — Jan 1939)
The defense of the Fort of Monte Festa (30 October-7 November 1917). (Ras Cul Mil — Feb 1939)
The artillery in the breakthrough in the mountains at the Dobropolie (Salonika Front), 14, 15, 16 September 1918; its part in the pursuit to the Danube. (Rv d'Art — Jan 1939)
The 55th Reserve Division in the " Miracle of the Marne." (Rv d'Inf — Feb 1939)
The war in glaciers. The combats in the Ortler Massif (Alps), 1915-1918. (Rv d'Inf — Mar 1939)
The Battle of Marchais and the " Miracle of the Marne." (Rv Mil Suisse — Jan, Feb 1939)
To what extent is transportation able to influence the inception and progress of military operations? (Ws & Wr — Jan 1939)
Legarde, the first major engagement in the World War, 11 August 1914. (Ws & Wr — Feb 1939)

J — Campaigns and Battles

ASIATIC AREA — TURKISH THEATER

Declaration of the Holy War by Turkey in 1914. (Mil-Woch — 9 Sep 1938)

Palestine Front

Offensive thoughts. (Ftg Forc — Jun 1939)
T. E. Lawrence. (Can Def Quar — Jul 1939)

EUROPEAN AREA — BALKAN THEATER

Serbian Front

Strategical studies of the World War (Austrian Plan). (Ras Cul Mil — Jan 1939)
Dobropolie (1918-1938). (Rv d'Inf — Feb 1939)
The artillery in the breakthrough in the mountains at the Dobropolie (Salonika Front), 14, 15, 16 September 1918; its part in the pursuit to the Danube. (Rv d'Art — Jan 1939)

EUROPEAN AREA — ITALIAN THEATER

The defense of the Fort of Monte Festa (30 October-7 November 1917). (Ras Cul Mil — Feb 1939)
The war in glaciers. The combats in the Ortler Massif (Alps), 1915-1918. (Rv d'Inf — Mar 1939)

EUROPEAN AREA — RUSSIAN THEATER

The War of 1914-1918 on the Russian Front. (Bul Belge Mil — Jan 1939)
My second mission in Russia during the World War. (Bul Belge Mil — Feb 1939)
Fight for a river, without bridge materials. (Mil-Woch — 4 Nov 1938)
Strategical studies of the World War (Austrian Plan). (Ras Cul Mil — Jan 1939)
To what extent is transportation able to influence the inception and progress of military operations? (Ws & Wr — Jan 1939)

EUROPEAN AREA — WESTERN THEATER

1914

Neglected mobility. The Corps Conneau at the Marne, September, 1914. (Cav Jour — Mar-Apr 1939)
An episode of the retreat (26 August 1914). Moral liaison of the arms. (Rv de Cav — Mar-Apr 1939)
The role of Fort Manonviller in the Battle of Charmes. (Rv d'Inf — Feb 1939)
The 55th Reserve Division in the " Miracle of the Marne." (Rv d'Inf — Feb 1939)
The Battle of Marchais and the " Miracle of the Marne." (Rv Mil Suisse — Jan, Feb 1939)
Legarde, the first major engagement in the World War, 11 August 1914. (Ws & Wr — Feb 1939)

1916

German engineers in the battle for Douaumont, 25 February 1916. (Pion — Feb 1939)
The first step of the British tank. The battle of 15 September 1916. (Rv d'Inf — Mar 1939)

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The Battle of Cambrai. Part II: Tank plans for the battle. (Tank Jour — Jul 1939)
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Fighting a chemical platoon. (Chem War Bul — Jul 1939)
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A surprise attack with tanks. The capture of the Porte and Loges Farms, 9 July 1918. (Rv d'Inf — Dec 1938)
The surprise attack of Flirey, 8 January 1918. (Rv d'Inf — Jan 1939)

L — Naval History

Aircraft against U-Boats. (Nav Inst Proc — Jun 1939)
Blockade in the Great War. (Jour RUSI — May 1939)
Co-operation between the German Army and Navy. (Nav Inst Proc — Jul 1939)

WEAPONS

The army's new weapons and equipment. (Jour RUSI — May 1939)
Springfield arms. (A Ord — Jul-Aug 1939)
The antitank gun. (A Ord — Jul-Aug 1939)
Place of the modified BAR in organization. (Inf Jour — Jul-Aug 1939)
Pocket artillery. [See " Foreign Military Digests"]
Artillery in olden times. (Mil Mitt — Feb 1939)
Motorization of the arms in foreign armies. The latest about equipment, organization and employment. (Panzer — Jan 1939)
Antitank defense. (Panzer — Jan 1939)
Theory and practice. (Panzer — Mar 1939)
Sub-caliber firing for antitank guns. (Panzer — Apr 1939)
Miscellaneous information. (Rv d'Art — Jan 1939)
Essay on the employment of tracers in antitank and antiaircraft fire. (Rv d'Inf — Feb 1939)
The antiaircraft defense of sensitive points with small arms. (Rv d'Inf — Mar 1939)
The atmosphere of a battlefield. (Rv d'Inf — Mar 1939)

WITHDRAWAL

Tactical employment of French large units. (Ras Cul Mil — Jan 1939)
The defense of the Fort of Monte Festa (30 October-7 November 1917). (Ras Cul Mil — Feb 1939)
An episode of the retreat (26 August 1914). Moral liaison of the arms. (Rv de Cav — Mar-Apr 1939)

Y

YUGOSLAVIA (ARMY OF)

Twenty years in the kingdom of the Slavs, Croats and Slovenes — Yugoslavia. (Ws & Wr — Jan 1939)
The military organization of Yugoslavia. (FA Jour — May-Jun 1939)

AIR OPERATIONS IN IMMEDIATE SUPPORT OF THE GROUND FORCES

Operations in immediate support of the ground forces in campaign are in furtherance of the immediate success of important operations.

(1) *Prior to battle,* they comprise:

(a) Interdiction of enemy air reconnaissance and air attacks by air combat and by attack of hostile aviation on its airdromes.

(b) Reconnaissance for purposes of security and information.

(c) Attack upon enemy communications and supply.

(d) Attack upon enemy concentrations and movements.

(2) In the battle itself, employment should be as follows:

Air attacks upon enemy personnel and material objectives having a direct influence on the possible outcome of the ground battle.

(3) *At the conclusion of the battle:*

(a) *If we are victorious:*

(i) Interdiction of enemy air operations, in order to facilitate pursuit of our ground forces.

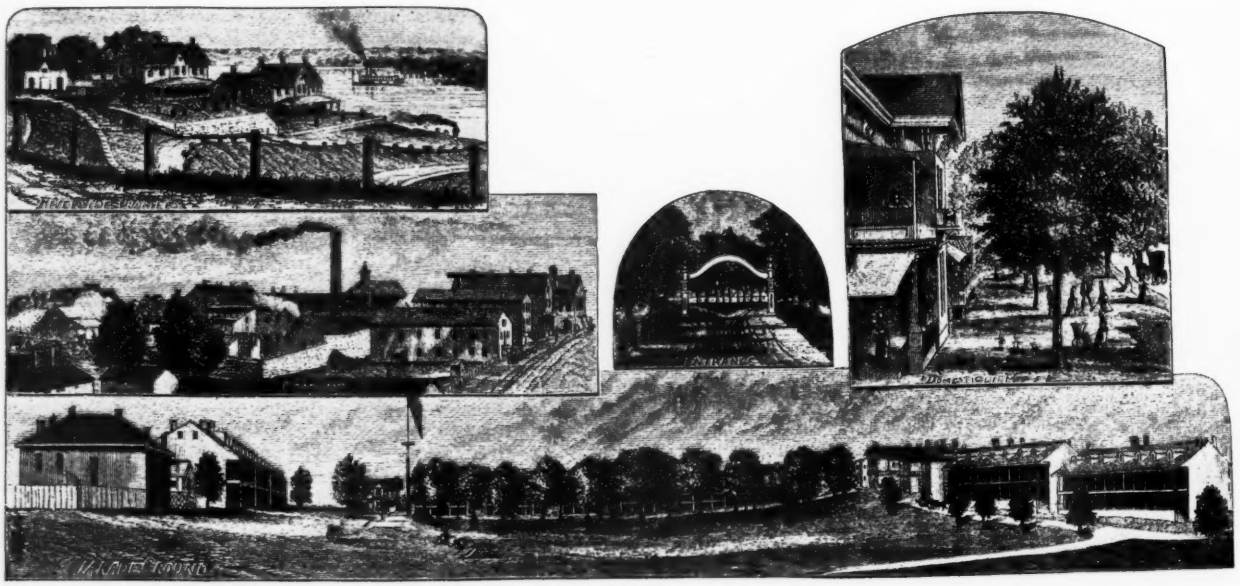
(ii) Harassment and interdiction of the enemy's retreat.

(b) *If the enemy is victorious:*

(i) Interdiction of enemy air operations designed to harass or to prevent the withdrawal of our ground forces.

(ii) Harassment and interdiction of the pursuit conducted by enemy ground forces.

Air and ground operations must be closely coordinated if effective results are to be obtained. This requires that all operations be conducted in acordance with a well-coordinated plan, and that commanders of ground forces, as well as commanders of air forces, thoroughly appreciate the powers and limitations of every combat arm.



VIEWS IN FORT LEAVENWORTH ABOUT 1877

Houses on Riverside, the U. S. D. B. Area

Arch at the head of Grant Avenue.

"Syracuse House" which stood at the northwest corner of the Main Parade.

The Beginning of the U. S. D. B.

View of the Main Parade (Sumner Place).

HISTORY OF THE COMMAND AND GENERAL STAFF SCHOOL

★ ★ ★

PART III

The new school was housed in the building at the northwest corner of Kearney and McClellan Avenues, known for years as the Administration Building and afterwards occupied by the Army National Bank. The first class consisted of forty-two lieutenants, and it inaugurated the work with creditable professional zeal. Colonel Otis reported to the War Department that "the progress of the first class has been entirely satisfactory, and the officers composing it have shown a degree of application and appreciation of the course that is alike honorable to them and deserving of commendation."

In 1886 the name of the school was changed to "The United States Infantry and Cavalry School" by the following order:

HEADQUARTERS OF THE ARMY
ADJUTANT GENERAL'S OFFICE

WASHINGTON, *June 22, 1886.*

GENERAL ORDERS
No. 39.

1. To secure uniformity in official communications addressed or referring to the school of application established at Fort Leavenworth, Kansas, it is hereby announced, for the guidance of all concerned, that the school will hereafter be known and designated as "The United States Infantry and Cavalry School."

* * * * * * *

BY COMMAND OF LIEUTENANT GENERAL SHERIDAN:

R. C. DRUM,
Adjutant General.

On 15 July 1887, the War Department appointed a Board of Officers to prepare new school regulations. General Thomas H. Ruger, formerly Colonel of the 18th Infantry and Commanding Officer of the School, was designated as President of the Board. The result of the labors of this Board was approved by Lieutenant General Sheridan, commanding the Army, and was published in General Orders No. 17, A.G.O., March 27, 1888, which formed the first permanent regulations and program provided for the school. Some of the features of these regulations which are at present of considerable interest are here repeated:

HEADQUARTERS OF THE ARMY
ADJUTANT GENERAL'S OFFICE

WASHINGTON, *March 27, 1888.*

GENERAL ORDERS
No. 17.

The accompanying regulations and programme of instruction for the U.S. Infantry and Cavalry School, Fort Leavenworth, Kansas * * * are approved * * *.

OFFICIAL DESIGNATION, ORGANIZATION, AND ADMINISTRATION

* * * * * * *

9. The student officers required to take the prescribed course of instruction shall be one lieutenant from each regiment of infantry and cavalry, to be nominated by the commanding officers of the several regiments, and detailed in orders from the Headquarters of the Army, and such lieutenants belonging to the troops of cavalry and companies of infantry present at the school as shall be detailed by the commandant upon the recommendation of the staff.

* * * * * * *

INSTRUCTION

21. The course of instruction shall embrace two years of study and practical exercises, each year to constitute one term.

* * * * * * *

25. The student officers will be embraced in one class, and shall, for the purposes of instruction, be divided into sections of convenient size * * *.

* * * * * * *

27. Instructors and assistant instructors shall keep marks of all recitations and exercises of students under their charge, and at the end of each week submit reports of the same to the Commandant. Such reports will be considered by the staff in determining the proficiency and standing of the students.

* * * * * * *

29. Maximum marks given for perfect recitations shall be 3; for a total failure 0; and between these limits, according to quality, fractions expressed in tenths.

30. The studies shall embrace the study of text-books and recitations therefrom, supplemented by lectures and exercises in application as laid down in the programme for each course. The recitations shall not as a rule exceed two hours for each section.

* * * * * * *

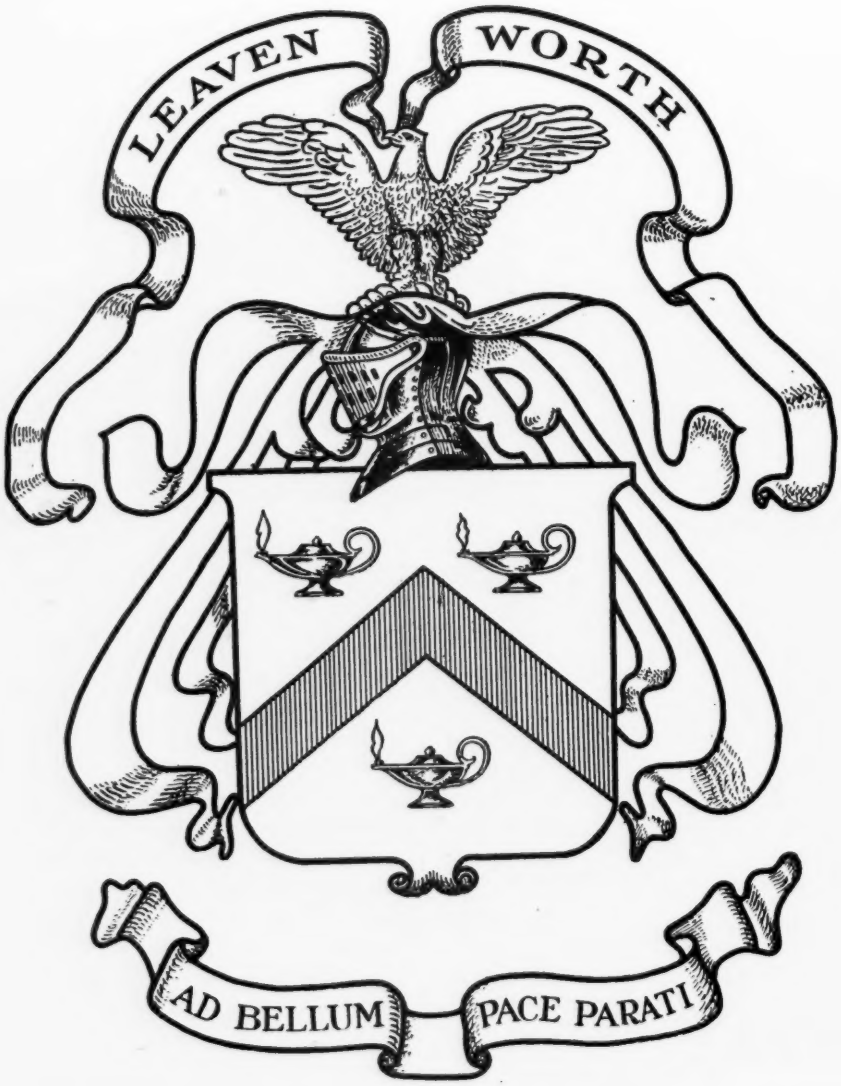
34. The annual examinations shall take place during the month of June in each year.

* * * * * * *

39. Each member of a section shall draw one from the list of subjects previously prepared by his instructor, upon which he shall recite, and thereafter he may be further examined at the discretion of the staff. The staff shall record the result, assigning numerical values to recitations, as is directed in paragraph 29, and after the examination of a class on a subject is concluded, will arrange the members of the same according to merit based upon the value of marks received during the term and at examination—the examinations to have one-third of the weight of the term marks.

* * * * * * *

(To be continued)


LEAVEN
WORTH
AD BELLUM
PACE PARATI